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The schools considered are ten representative examples of recent and planned elementary and junior high schools designed to house team teaching programs. Discussed are the concepts of team teaching, the demands it places on school construction and organization, and methods by which these concepts and demands are satisfied in the ten schools.

General considerations for team teaching are suggested. All team programs involve a great deal of movement, including the forming and dispersing of large and small groups. Buildings should make such grouping and movement natural and easy, while avoiding chaos. Team programs gravitate toward a nongraded organization, with greater emphasis on individual study. Such a tendency indicates the need for the enlargement of the school library into a central instructional resource center with an increasingly wide range of materials. The increased amount of cooperative planning and preparation which a team program involves demands special team headquarters space and special teacher workrooms. Team programs seem to be moving toward increased use of audiovisual aids and teaching machines, and team schools should be designed with such devices in mind.

Carson City Elementary School consists of three separate clusters of open space. Each teaching team in Lessenger and East Elementary Schools is housed in a "quad," a cluster of four classroom spaces grouped around a central workroom and teaching area. Marie Creighton Junior High School will contain: a group of three classrooms arranged as a trapezoid to form a team "triad"; and a little theater seating 100 students, which can be expanded to a 400 seat auditorium by sliding back a movable partition and joining the theater to the adjacent cafeteria.

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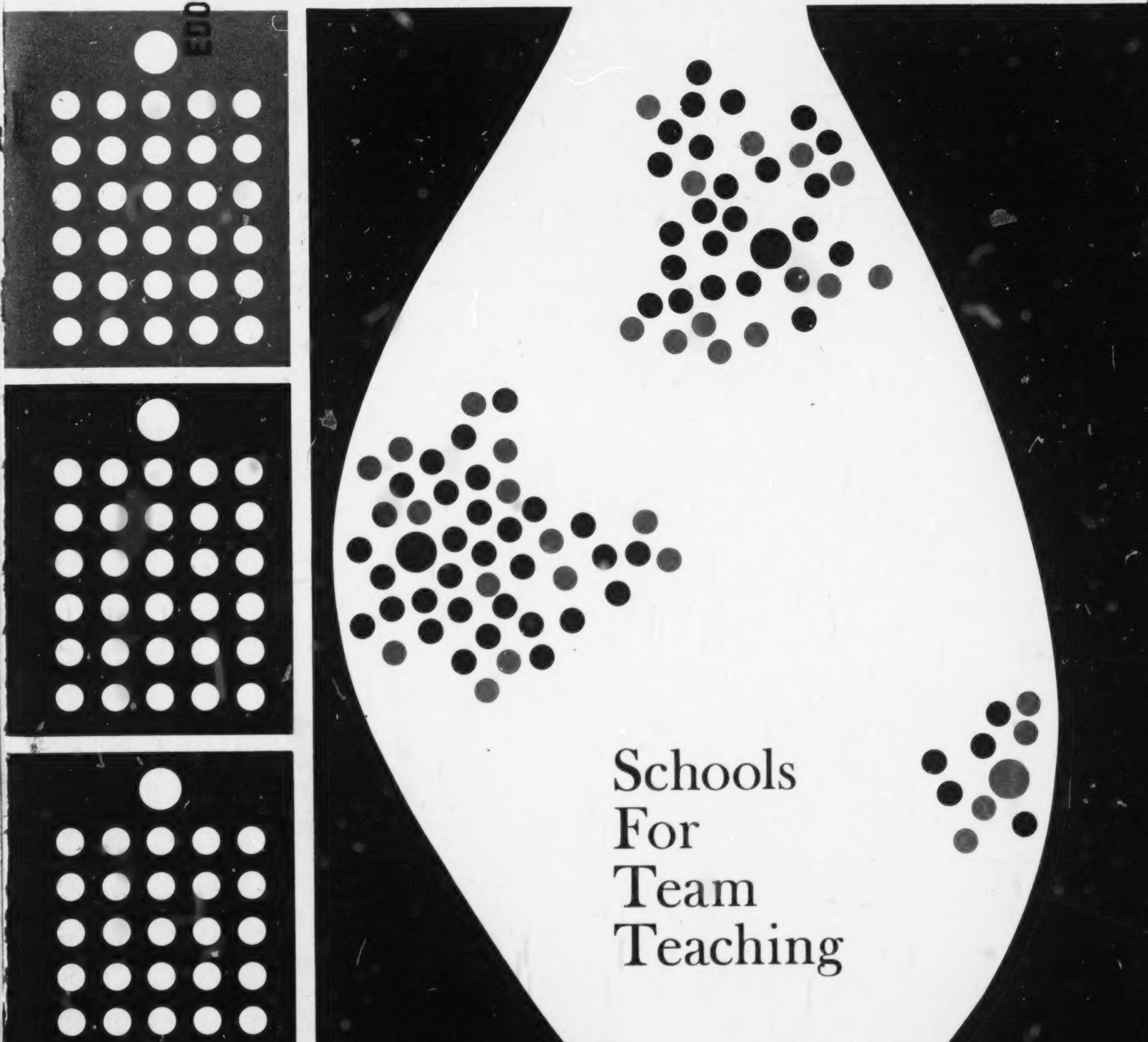

Schools For Team Teaching

PROFILES OF SIGNIFICANT SCHOOLS

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PROFILES OF SIGNIFICANT SCHOOLS

Schools For Team Teaching

Prepared by Evans Clinchy, Editorial Associate

EDUCATIONAL FACILITIES LABORATORIES

A Note on Research

The facts and figures on the schools in this PROFILE were gathered by the writer with the assistance of the following people:

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Introduction

The schools considered in this PROFILE are representative examples of recent and planned elementary and junior high schools designed to house team teaching programs. They are not the final solutions to the various problems that team teaching poses, nor are they the only pertinent examples of such schools.* Team teaching itself is still in an experimental stage of development. Therefore, schools designed for team programs are experiments. But both the educational idea and the schools planned for it represent new and adventurous thinking, an attempt to meet this country's mounting educational challenges. As such, EFL feels they are well worth the attention of everyone concerned with better education.

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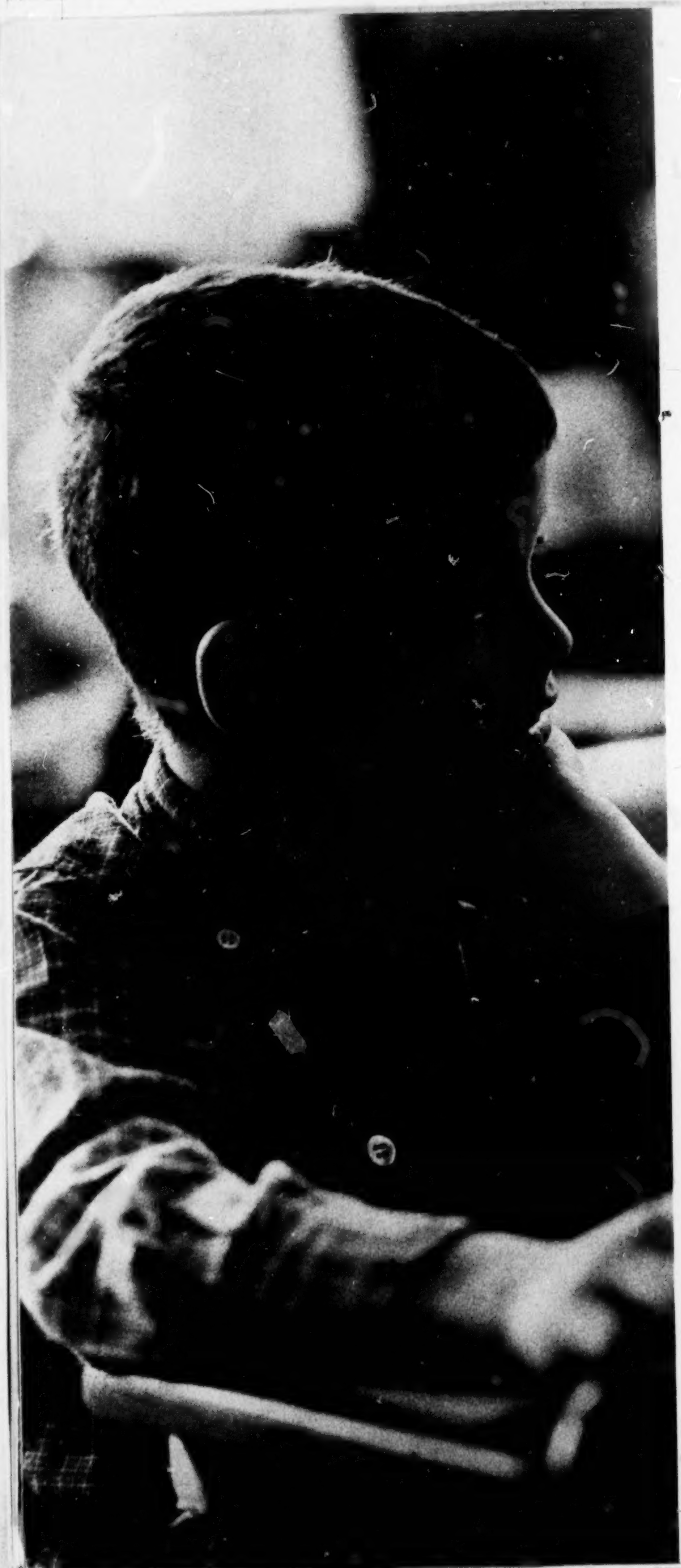
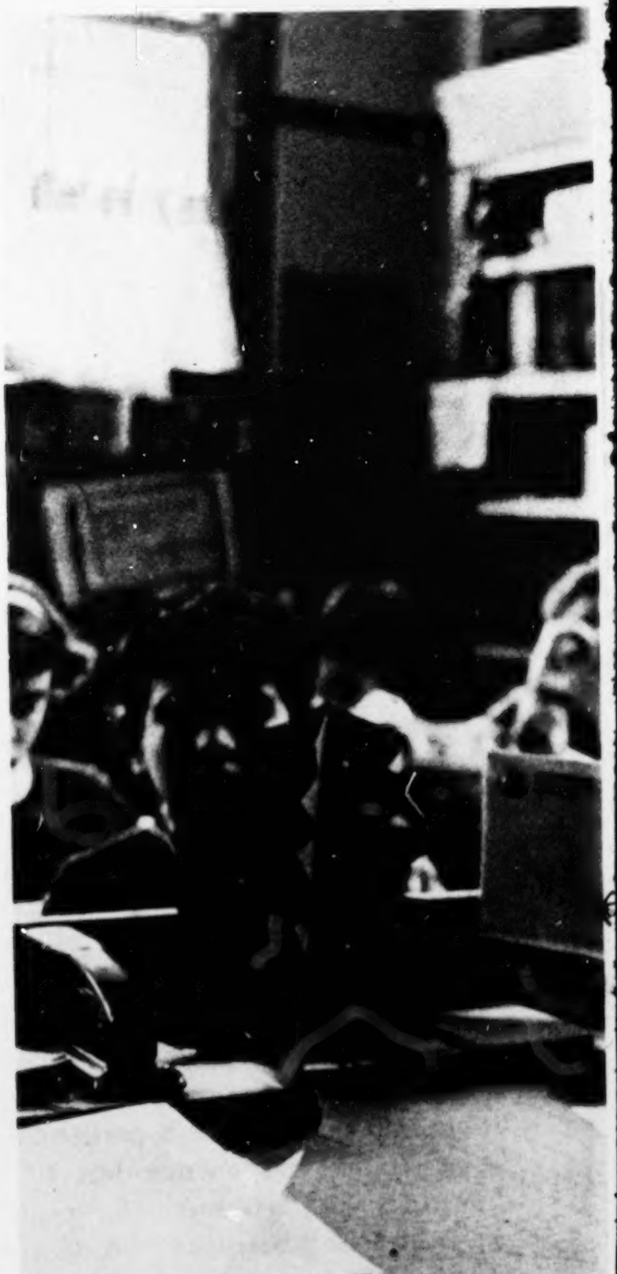
*The reader is referred to three earlier EFL *Profiles of Significant Schools:* Wayland Senior High School, Wayland, Massachusetts; Ri[illegible]wnship High School, Olympia Fields, Illinois; and Two Saginaw Middle Schools, Saginaw Township, Michigan.

Teaching In Teams

This is Mary, aged nine, an extraordinarily bright student. She has a particular flair for social studies and science, but she has her difficulties with arithmetic. Since she is nine, she is in Miss Abernathy's fourth-grade class, although in terms of her ability she could easily handle fifth-grade work, and by the time she reaches grade six she will be capable of achievement two or three years beyond her grade.



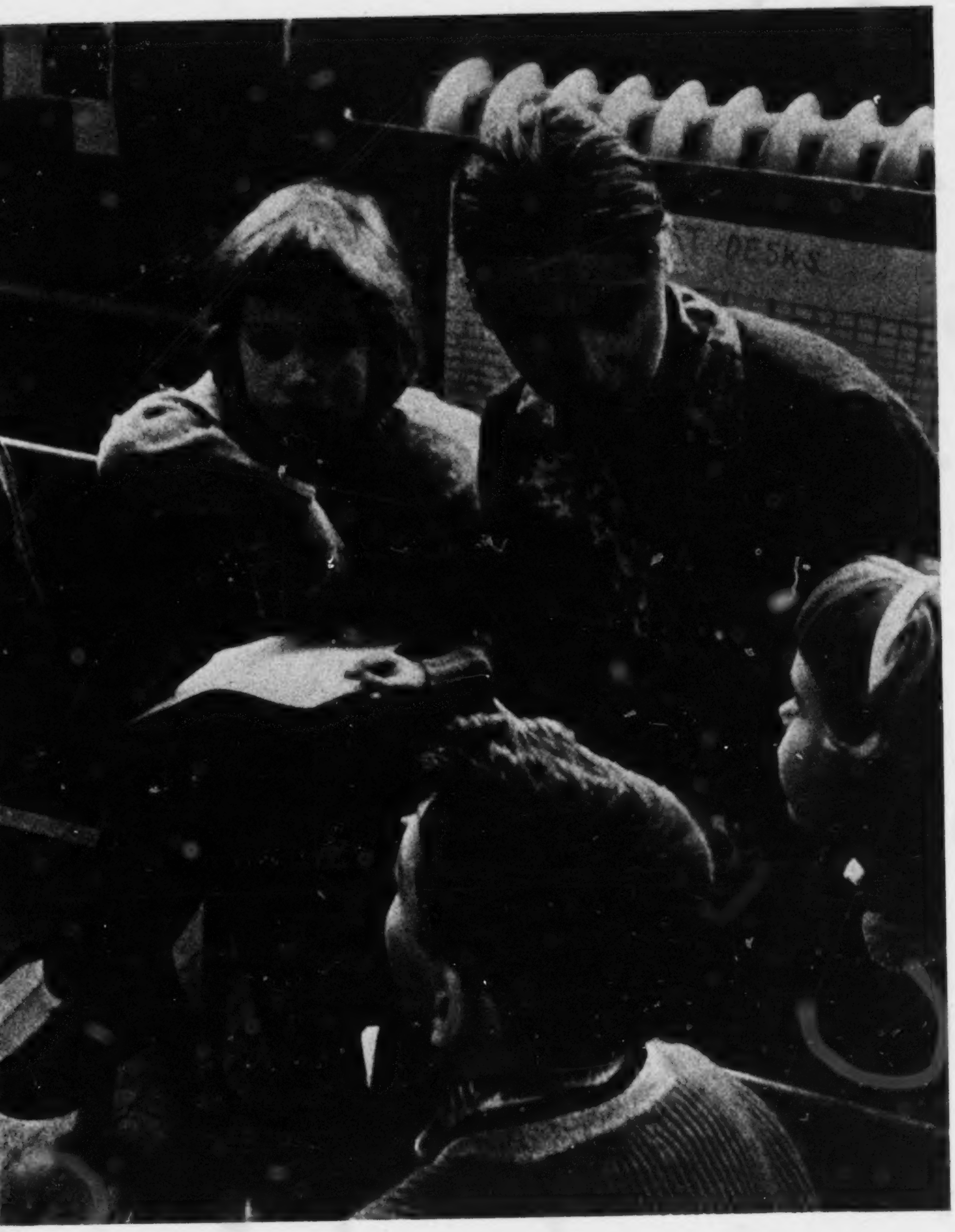
This is Robert, also aged nine, but below average in all of his studies except arithmetic. Robert finds much of his class work too difficult. He is really a third grader and will probably need seven years to complete his elementary education. But since Robert is nine, and not severely retarded, he too is in Miss Abernathy's fourth-grade class.

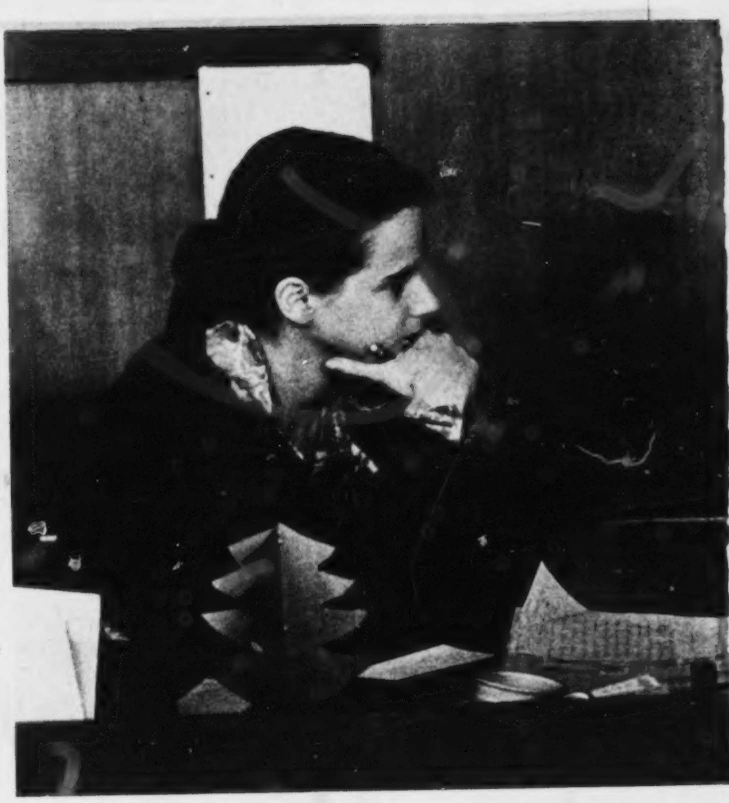


And this is Miss Abernathy whose job is to teach Robert and Mary and 28 other children of diverse talents and interests. Miss Abernathy is a capable teacher with a strong talent for social studies, but she has relatively less interest and no special training in arithmetic and science.

The rules tell her that there is a specified amount of fourth-grade material her children should absorb during their year in her classroom. As much as possible she divides her 30 students into groups according to their abilities in various subjects.

She develops — whenever possible — special projects for Mary and other brighter children to work at on their own. She tries to give



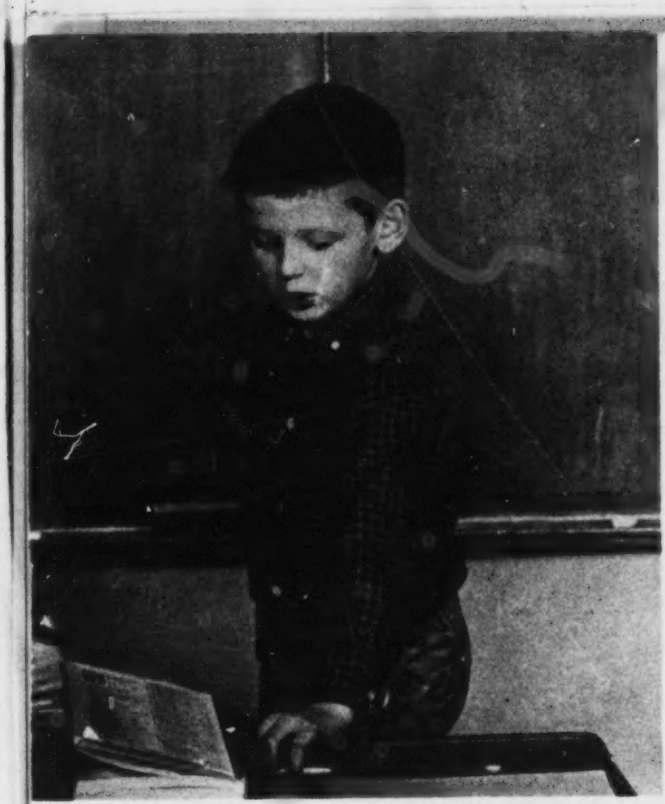


Robert as much special, individualized help as possible. But her time is limited, and much of it is spent, among other things, on grading papers, keeping attendance records, running the class savings accounts, supervising the playground and lunchroom, and talking to parents.

Because she has the responsibility for the education of her 30 children, she is forced by the simple exigencies of time and energy to concentrate her main efforts on the bulk of the class which is average in ability and achievement—the children for whom the fourth-grade program was designed. All of her children receive a stimulating year of social studies, Miss Abernathy's special field. But Mary gets little advanced work in science (in part because Miss Abernathy dare not poach upon the topics assigned by the courses of study for next year—grade five). And Robert does not get the help he needs in everything except arithmetic (or, for that matter, the special encouragement he needs in his one good subject).

Miss Abernathy has other difficulties, too. She is an experienced teacher and will probably stay in the profession. But there are moments when she has her doubts.

Moments when she is sitting alone in her classroom fighting through stacks of paperwork. Or moments when she wonders what to do with the Roberts and Marys who don't quite fit the standard fourth-grade pattern. Or moments when she looks forward with

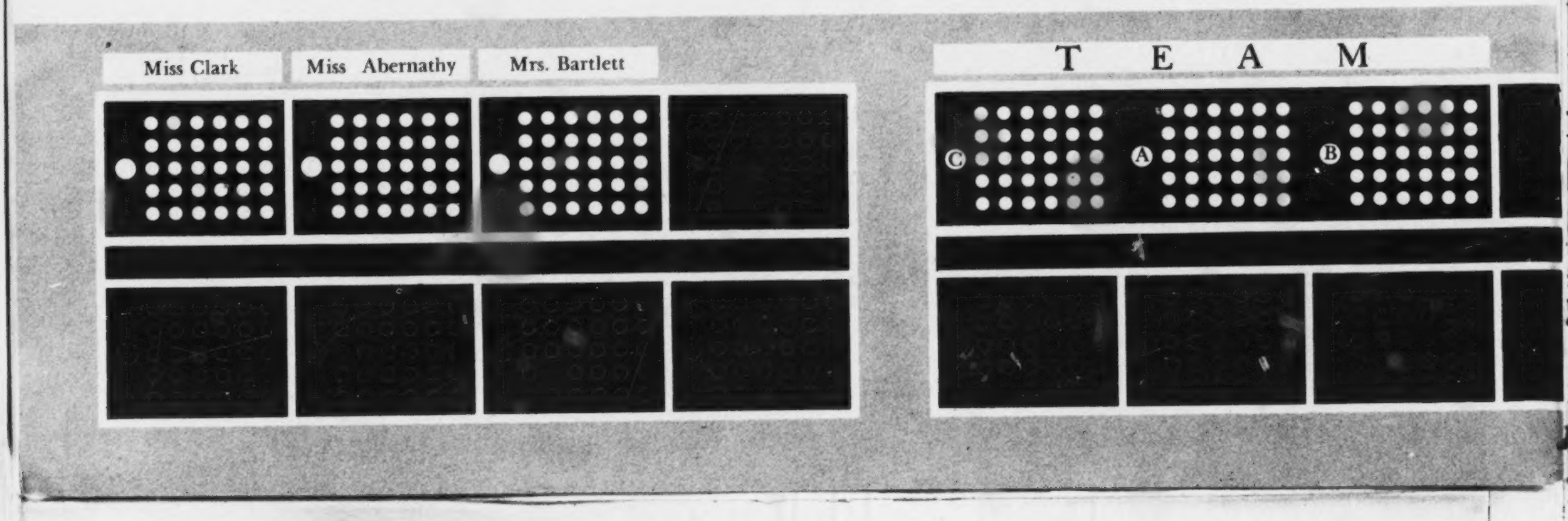


mingled apprehension and weariness to the next year of 30 fourth-grade children, each possessing his own peculiar quirks and each of them her responsibility. These are the moments when she feels most alone and most unprofessional, moments when even a superior salary does not keep her thoughts from wandering to visions of jobs that might be less emotionally demanding and more professionally stimulating.

Not Her Problem Alone

There are two other fourth-grade teachers in Miss Abernathy's school, each in a classroom next to hers, each responsible for the education of 30 children.

Mrs. Bartlett is an expert in arithmetic and science who could help Mary with her science interests and arithmetic difficulties. Miss Clark is especially good with slower children — a natural teacher for Robert. But neither Robert



nor Mary will receive the special help available next door because the school's educational traditions decree that each group of 30 children will have a single teacher. And the schoolhouse they are in decrees that each class be separated from the one next door by a solid wall.

And because the three teachers have little if any free time, there are few opportunities for them to get together and compare notes or exchange helpful hints. Perhaps a few moments are snatched in the teachers' lounge or after school, but that is about all.

One Response

In a few school systems around the country, the problems facing Robert and Mary and the teaching trio of Abernathy, Bartlett, and Clark are being attacked in a novel manner. These new programs, all still experiments, are called team teaching.

In a team program, the teachers, instead of spending their entire day with the same 30 children, are formed into teams varying in size from two to seven or eight teachers. Miss Abernathy, Mrs. Bartlett, and Miss Clark, for instance, might well be formed into a team responsible for 90 fourth-grade children.

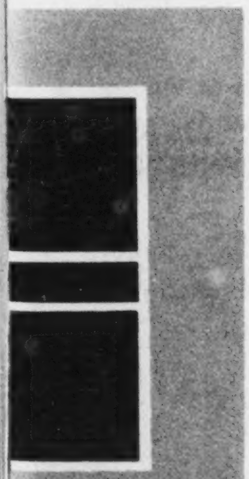
Robert and Mary are reorganized, too. Instead of having just Miss Abernathy for a teacher, they now are taught by Mrs. Bartlett and Miss Clark as well. Mary has the benefit of Mrs. Bartlett's expert knowledge of science and arithmetic. Robert is exposed to Miss Clark's persuasive ways with slower children. And now all 90 children receive Miss Abernathy's superior teaching of social studies.

Because the teachers operate as a team, they can organize the children into different sizes and kinds of groups. For a social studies film, television program, or lecture suitable for the entire fourth grade, up to 90 children are gathered together under Miss Abernathy. This leaves Mrs. Bartlett and Miss Clark free to plan their own special programs or to take smaller groups of children for advanced or remedial work.

Because the teachers have 90 children to draw upon, Robert and Mary spend more of their time in groups geared to their unique abilities and limitations. Out of 90 children, there are enough science students at Mary's level to warrant a planned, continuing program of advanced science work. Similarly, there are enough students experiencing Robert's difficulties to warrant careful, imaginative programs for him. The more average groups are divided in the same way – with Mary and Robert in the same arithmetic group since this is Robert's best subject and Mary's weakest.

Again, because the three teachers are members of a team they are able, indeed required, to plan their program cooperatively. The children are organized into their different groups according to the educational task, and this organizing and reorganizing can take place at any time and in any way the teachers feel will advance the program. Such planning bears no resemblance to the "departmentalization" typical of most high schools where children are organized into tight, standardized subject groups and are swapped back and forth by the teachers upon the signaling of a bell. A team works much more freely, crossing subject lines, combining subjects when appropriate, and in general tailoring the program to fit the children's abilities.

Team teaching has other advantages, according to the theorists and experimenters. Beginning teachers, for instance, can enter a school system as part of a team and learn the ropes under the guidance of a superior, experienced teacher. The hierarchy of a team (team leader, regular teachers, beginning teachers, perhaps clerical assistants) creates a naturally differentiated pay scale, thus enabling a school system to reward its most effective teachers with more money without making administrators out of them.



Old Buildings Don't Work

There are many possible ways of organizing teachers into teams and many possible ways of grouping children to improve the instruction they receive.

But all of the methods now being tried out in experimental team teaching programs are severely handicapped when forced to function in the typical school building designed with two rows of classrooms of equal size separated by a long narrow corridor.

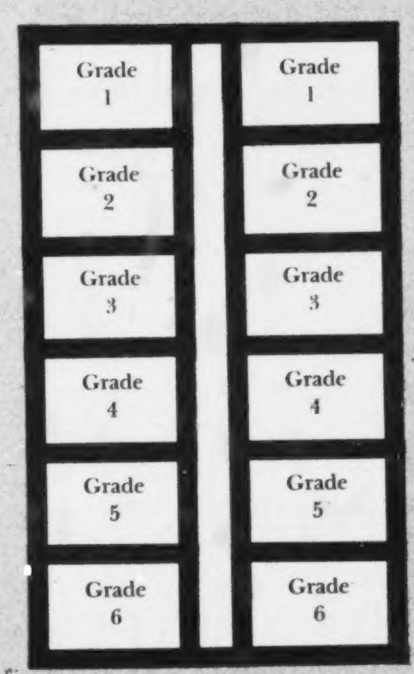
Team teaching programs all appear to require school space that provides several fundamental things not available in many schools today:

■ The space must be able to accommodate groups of various sizes, anywhere from 100 students down to one or two children studying by themselves.

■ The space must allow the rapid shifting of group size and the rapid changing of the participants of any group — continual motion throughout the school day is one inevitable result of team teaching.

■ The space should include a place in which teachers can meet and work privately, and hopefully a workroom for the preparation of special instructional material.

What these requirements mean in essence is that the educational barriers built into the conventional school building must be removed or significantly altered.


Grade 1
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Grade 2
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Grade 3
Grade 4
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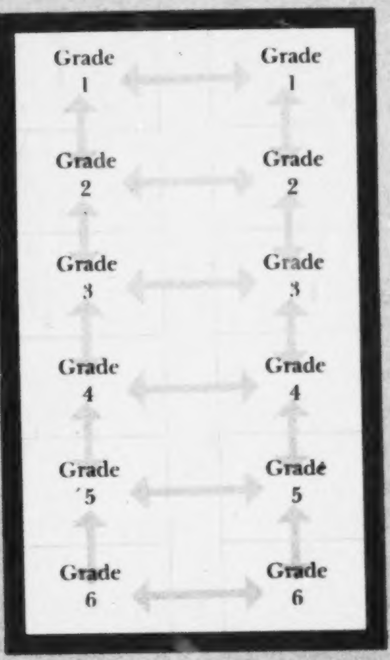
Grade 5
Grade 6
Grade 6


Grade 1
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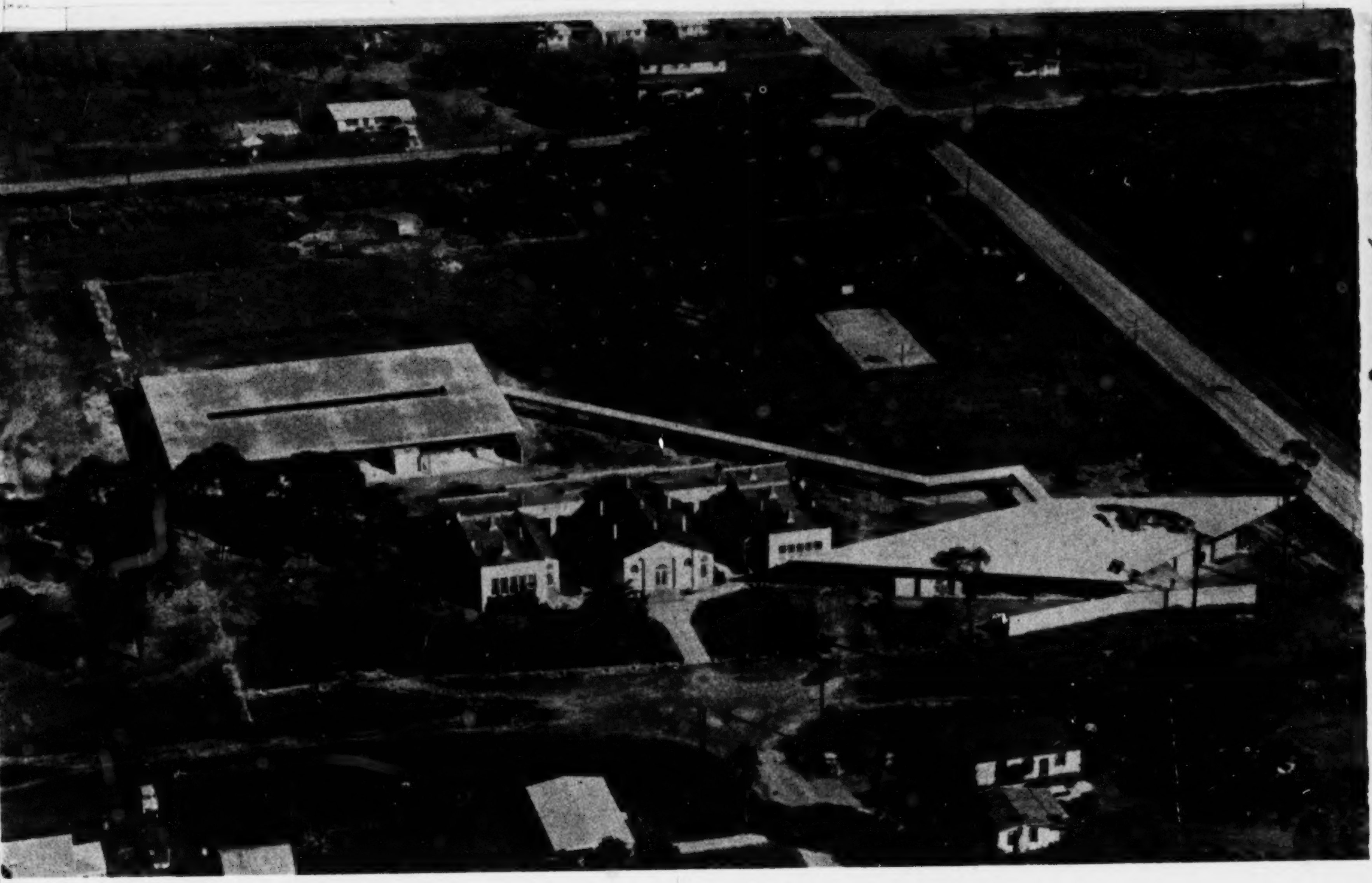
Two Pioneers

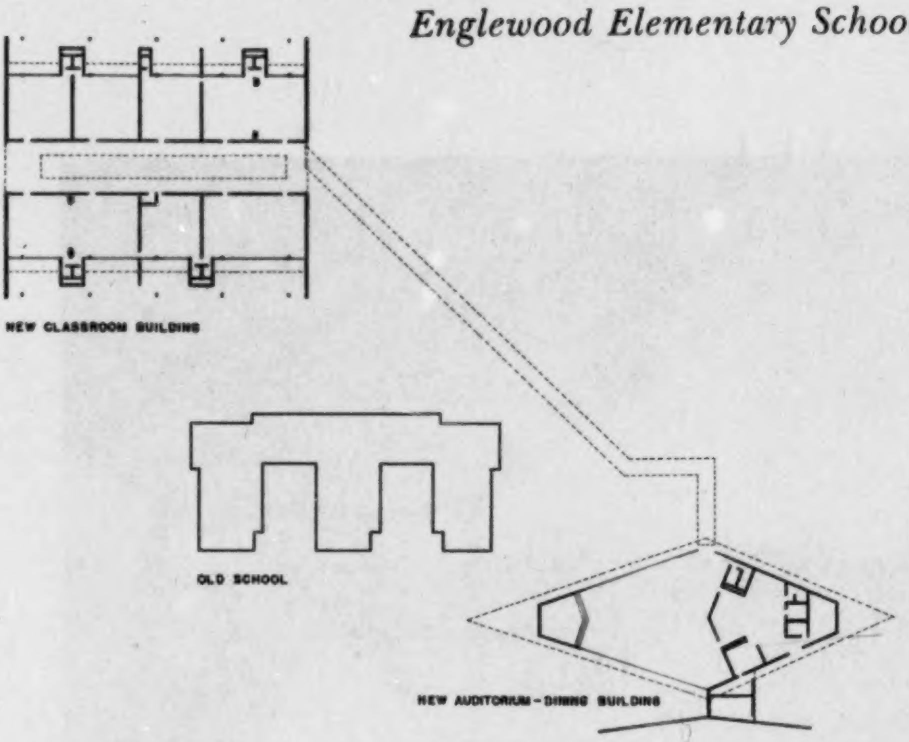
Englewood Elementary School
Englewood, Florida

Carson City Elementary School
Carson City, Michigan



SCHOOL:	*Englewood Elementary School Englewood, Florida*
PUPIL AGES:	*5 years to 11 years. There are no formal grades.*
PRESENT ENROLLMENT:	*416 pupils*
CHAIRMAN OF SCHOOL BOARD:	*Philip H. Hiss*
SUPERINTENDENT:	*Carl C. Strode, for the Sarasota School System*
PRINCIPAL:	*John M. Bahner*
ARCHITECTS:	*Bolton McBryde Fort Myers, Florida West and Waters Sarasota, Florida*
EDUCATIONAL CONSULTANTS:	*John I. Goodlad University of California at Los Angeles Robert H. Anderson Harvard University*

Englewood Elementary School



Englewood, Florida, is a small Gulf Coast community of about 6,000, mostly retired people, commercial fishermen, winter vacationers, and men employed in the building trades. The changes that have taken place in Englewood's elementary school have been made possible by the adventurous thinking of the school board and by a generous grant of money from Mr. and Mrs. William H. Vanderbilt and Mr. Alfred Gwynne Vanderbilt. This grant began in 1953 and will be terminated within the next few years. The money has enabled the school to hire first-rate teachers, administrators, and consultants to develop the Englewood program.

When the new buildings for the Englewood Elementary School in Sarasota County, Florida, were designed in 1956, team teaching was little more than an adventurous thought in the minds of the school board and the school's educational consultants.

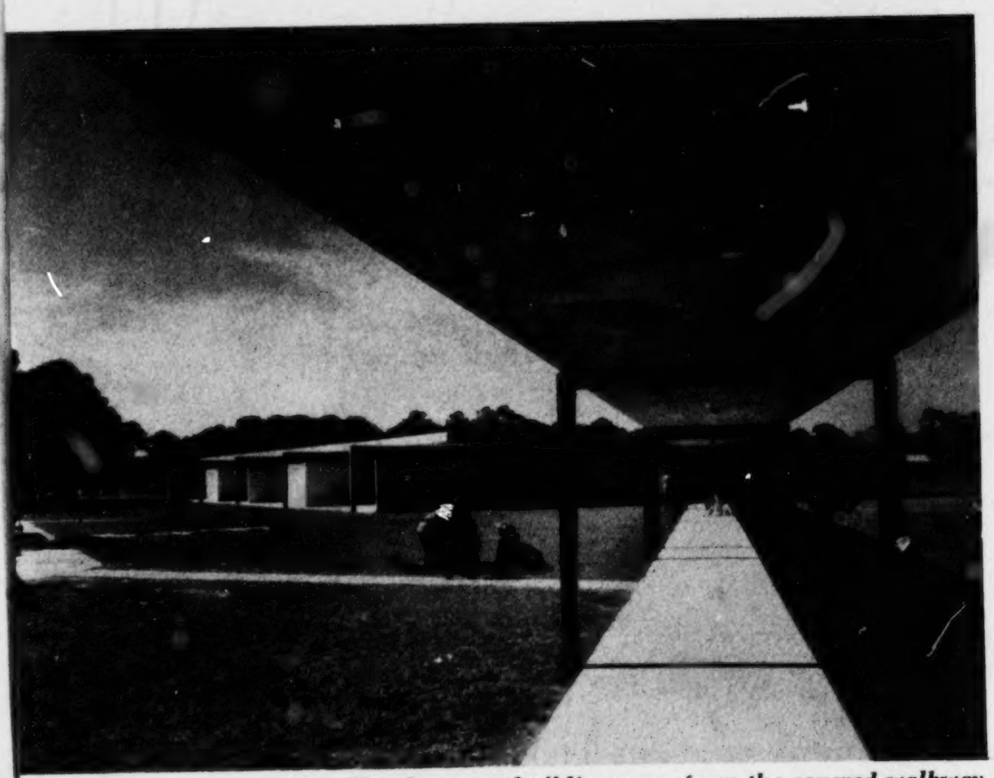
The school was, in fact, first laid out for a conventional program, but halfway through the design process these plans were torn up. No one was exactly sure what kind of educational organization was going to emerge at Englewood, but everyone involved concluded that the building should be able to adapt itself to a number of different programs, team teaching among them.

The first, and so far only, stage of the new Englewood Elementary School (above) opened in September, 1958. It holds 270 of the school's 416 children. The remaining 146 students are still housed in the old building which will eventually be replaced.

Englewood as a Team School

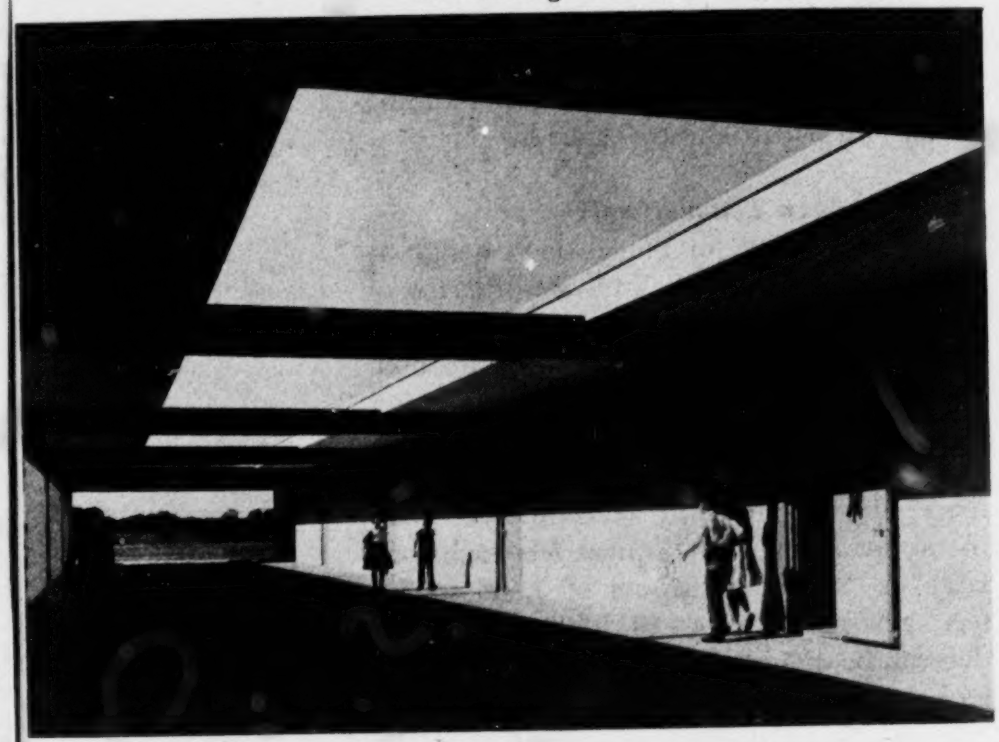
The significance of Englewood's design as a team school lies in the unusual ordering of space in and around its classroom building.

In order to make the Englewood classroom building adaptable to the new program and to groups of varying sizes, the architects provided four different kinds of educational space. There are four conventional classrooms, averaging 1,000 square feet each; one large or "super" classroom of 1,500 square feet; a large classroom of 1,500 square feet that can be divided into two small 750 square foot classrooms by means of a vinyl accordion



The classroom building, seen from the covered walkway.

The building is divided in half by a central court.



partition; and a double classroom of 2,000 square feet, also divisible by a partition into two regular 1,000 square feet classrooms.

Teams at Englewood

During the past school year (1959-60), the teaching teams at Englewood have used these spaces for teaching in a way that would have been difficult if not impossible in a more conventional building.

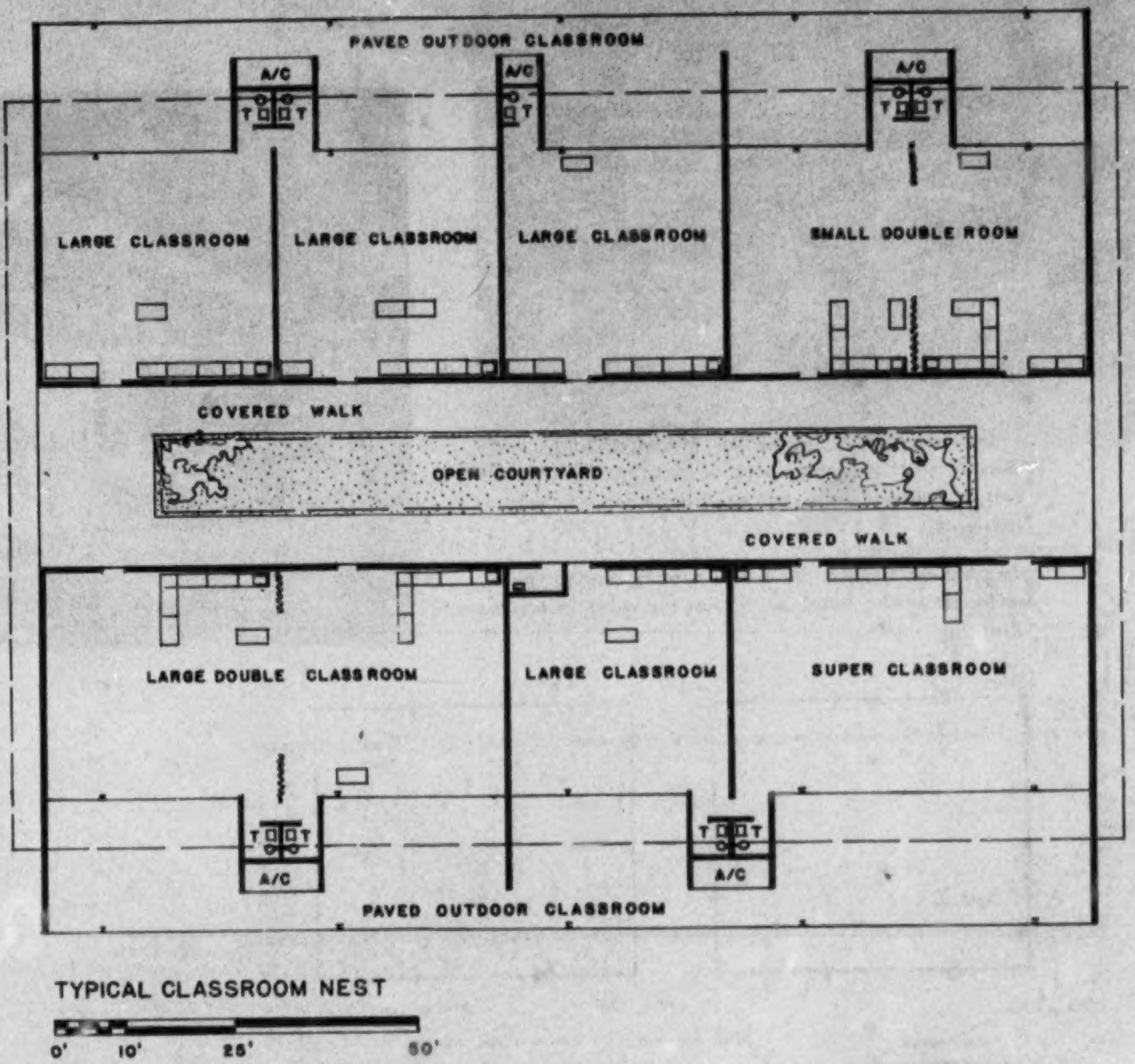
For example, last year a teacher with a class of six- and seven-year-olds and another teacher with a class of seven- and eight-year-olds merged their classes for a major portion of the day's activities.

These two teachers were assigned to one of the larger classrooms equipped with a folding partition. They planned cooperatively as a team throughout the year and were able to cut across class and grade lines to group children according to their actual achievement rather than by their chronological ages. In most conventional schools, these children would have been in grades one through three. Because of the team organization at Englewood, all of the children capable of reading on a fourth-grade level actually did fourth-grade level reading, even if some of them were first or second graders. All of the children capable of doing only first-grade arithmetic were operating on that level. This instructional flexibility was possible largely because the space at the teachers' disposal is adaptable. They were free to move their 60 or so children freely back and forth within a large, uninterrupted space.

An Approach to Adaptability

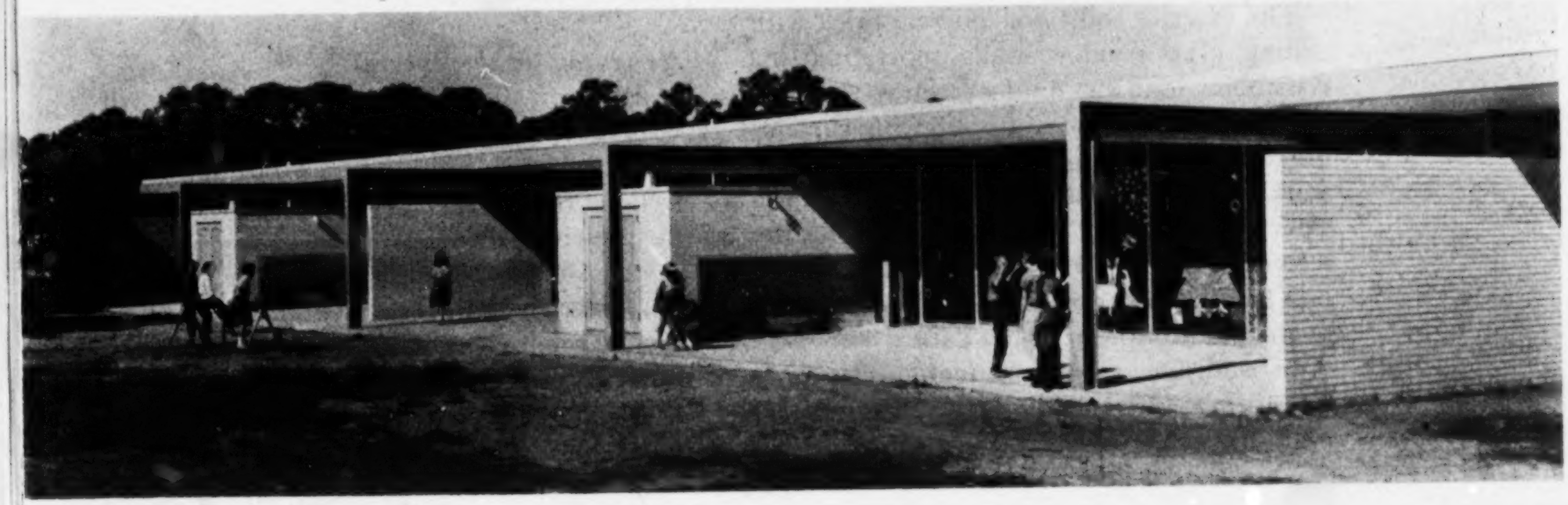
The educational and spatial freedom in the Englewood building was obtained by creating a column-free space and partitioning it only with accordion partitions or with concrete brick walls which can be removed if necessary.

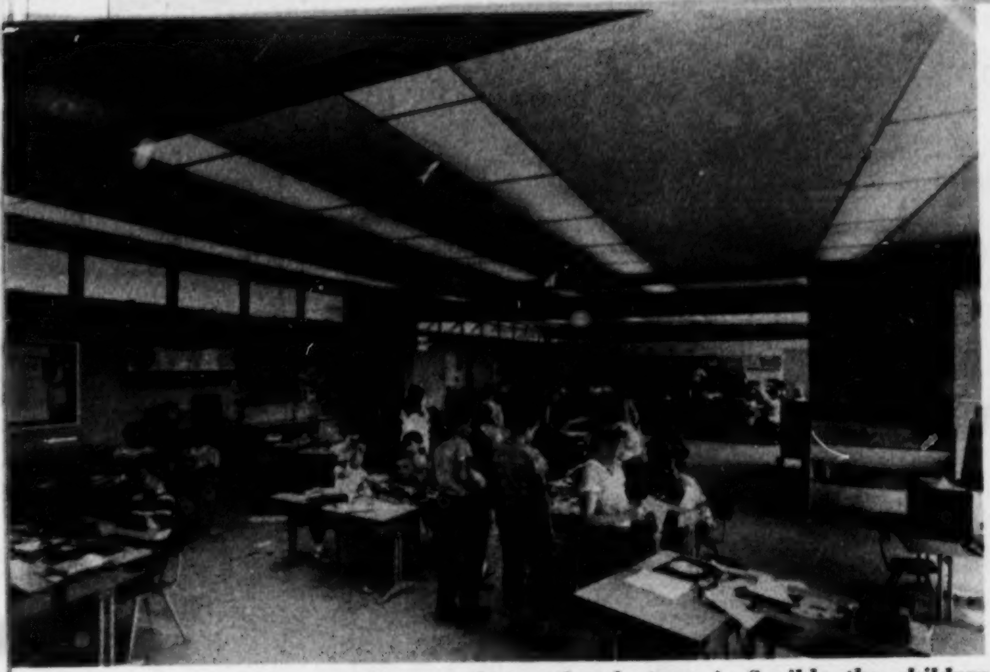
The design is based upon a repeated structural bay which not only serves the present building but also will be the basic design of the future classroom buildings at the school. The bay is composed of continuous, 126 foot steel bents, supported at the outside walls and at the edges of the paved patio area. These


PAVED OUTDOOR CLASSROOM
A/C
T
LARGE CLASSROOM
LARGE CLASSROOM
LARGE CLASSROOM
SMALL DOUBLE ROOM
COVERED WALK
OPEN COURTYARD
COVERED WALK
LARGE DOUBLE CLASSROOM
LARGE CLASSROOM
SUPER CLASSROOM
PAVED OUTDOOR CLASSROOM
0'
10'
25'
50'

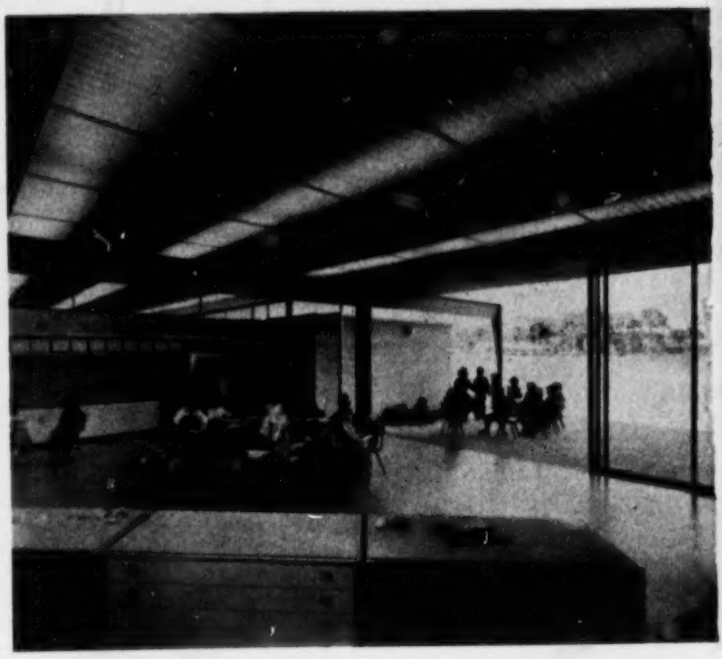
TYPICAL CLASSROOM NEST

Each classroom space at Englewood has its own outdoor patio for teaching and play. If the school decides to operate in the summer, the patios can be easily screened. Summer at Englewood brings both heat and mosquitoes.

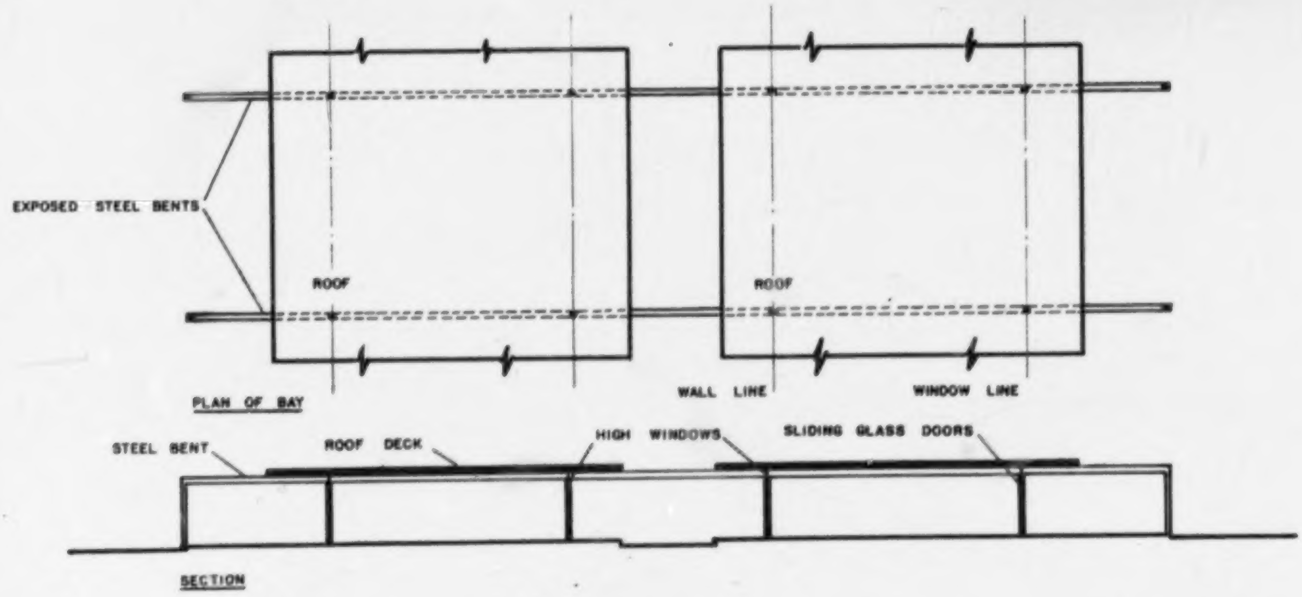




Because instructional space is flexible the children can be grouped in a variety of ways for a variety of activities.



In pleasant weather the teams use the outdoor patios adjacent to the rooms as well as the space inside the building.



bents bear all of the weight of the precast, prestressed concrete roof.

The exterior walls are concrete brick with sliding glass window walls separating the classrooms from the outdoor patios.

Each classroom is equipped with curtains on tracks to block out light for audio-visual work and for a planned program of educational television. (There are conduits for the television cables.) The entire ventilating system has been designed to adapt economically to air conditioning at a later date.

In addition to its adaptable classroom building, Englewood also features an unusual multi-use cafeteria and auditorium.

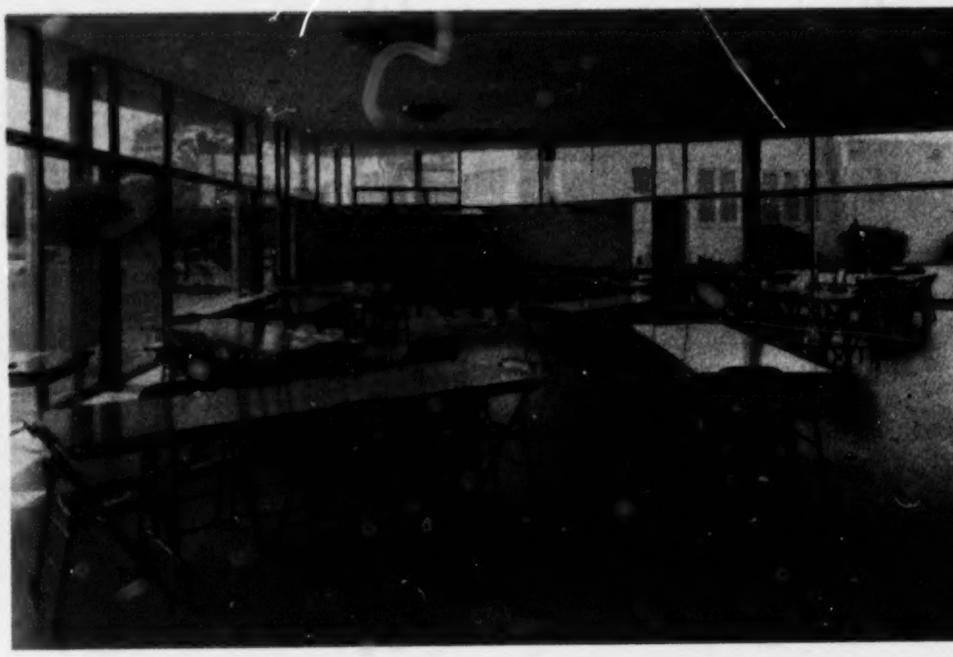
This "cafetorium," as it is called at Englewood, is designed to handle the eventual school population of 700 children.

Designing for the Future

Although the basic bay at Englewood will be repeated in the two future classroom buildings, the interiors of these buildings may well be quite different from the interior of the present academic structure.

One of the added buildings will be for kindergarten and primary children, the other for upper-grade children. Since the team program at Englewood is in a state of continual development, the interiors of these buildings will undoubtedly be far more adaptable than the existing arrangement. The school's program, in fact, has already reached the point where grade labels have been dropped entirely this year. Englewood is one of the country's few truly nongraded elementary schools.

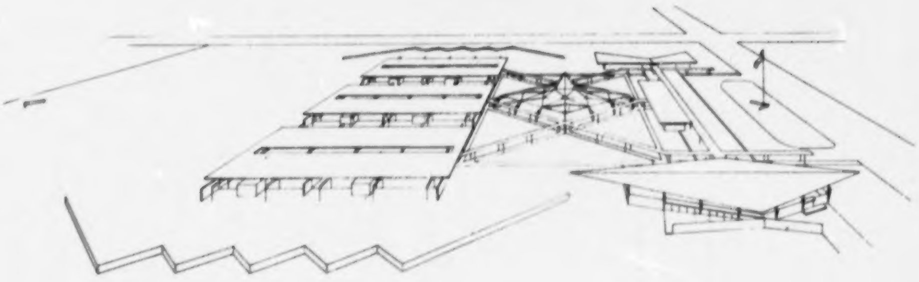
The completed school will also contain various other educational amenities which will make the work of the teams more productive and efficient. These include a studio for television broadcasting (combined with a community arts center) and an outdoor play area covered by a space frame constructed of a series of welded steel supports roofed with anodized aluminum panels. There will also be a building housing the administrative quarters, school library, health clinic, and teachers' lounge.

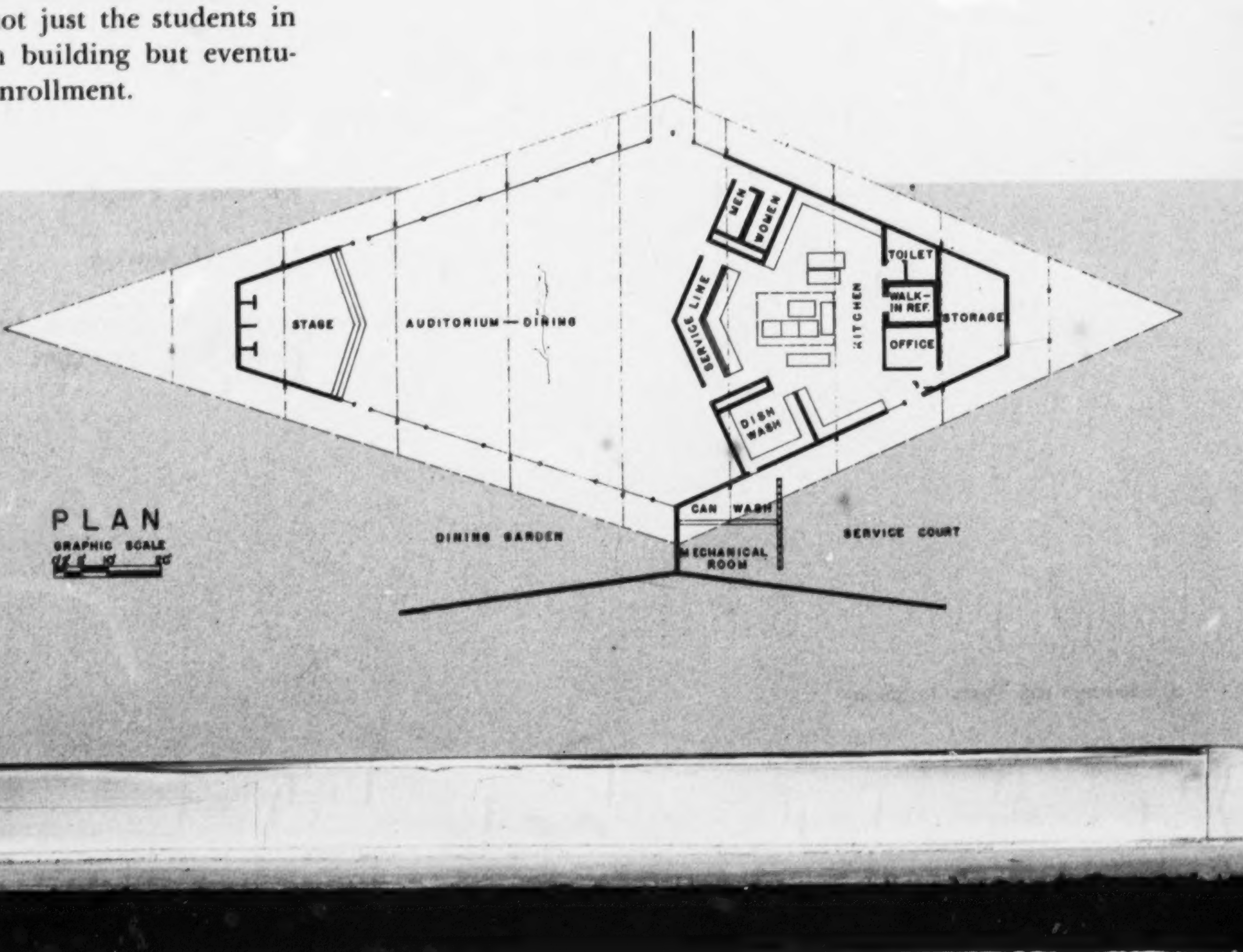


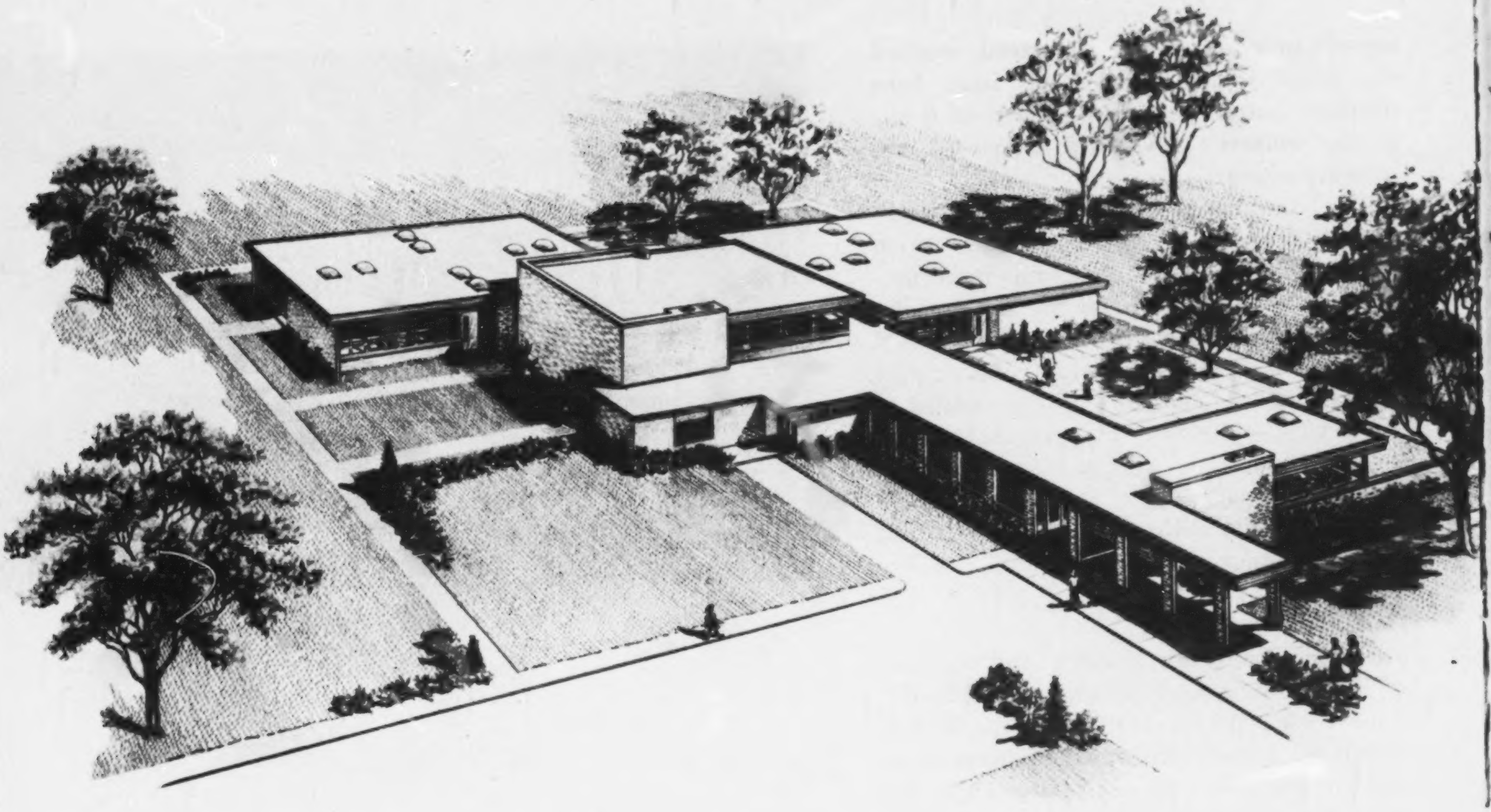
Cost

The new academic building and the cafetorium at Englewood cost the town $267,053. This figure is for the buildings alone, including all mechanical facilities, the folding doors, and the covered walkway between the two buildings. It does not include movable equipment. The two buildings contain 22,103 square feet, figuring covered and paved but unenclosed areas at one-half. This gives a cost per square foot of $12.08.

The cost per pupil is $989, based upon nine classrooms, each designed to house 30 pupils, or a design capacity of 270. This figure is not a true figure since the cafetorium is designed to serve not just the students in the existing classroom building but eventually the entire school enrollment.




PLAN
GRAPHIC SCALE
0' 5' 10' 20'
STAGE
AUDITORIUM — DINING
SERVICE LINE
MEN
WOMEN
KITCHEN
TOILET
WALK-IN REF.
STORAGE
OFFICE
DISH WASH
CAN WASH
MECHANICAL ROOM
DINING GARDEN
SERVICE COURT



SCHOOL: *Carson City Elementary School*
Carson City, Michigan

OPENED: *September, 1958*

DESIGN CAPACITY: *250 students*

GRADES: *1-6*

SUPERINTENDENT: *Thomas J. Vaughn*

PRINCIPAL: *Elizabeth Martin*

ARCHITECTS: *Louis C. Kingscott & Associates*
Kalamazoo, Michigan

Carson City, Michigan, is a town with a population of 1,200. The school system, however, takes in 150 square miles surrounding the town. The schools have been centralized in Carson City itself. Many of the replaced schools were one-room buildings set in remote farm areas.

Carson City Elementary School was designed in 1957—just about the same time as the Englewood school. But it demonstrates an entirely different approach to housing a team program, and it is an even more radical departure from the conventional idea of what a schoolhouse should be. For all practical purposes, Carson City is a team school with no interior walls.

A School Without Walls

Carson City Elementary School consists of three separate clusters of open space, each cluster containing 4,400 square feet or the rough equivalent of four conventional classrooms. (See page 22.) The two academic clusters have a central core of toilets and other plumbing facilities. The administrative cluster contains partitioned space for offices, a teachers' lounge, a kitchen, and the school's mechanical facilities as well as a large multipurpose room.

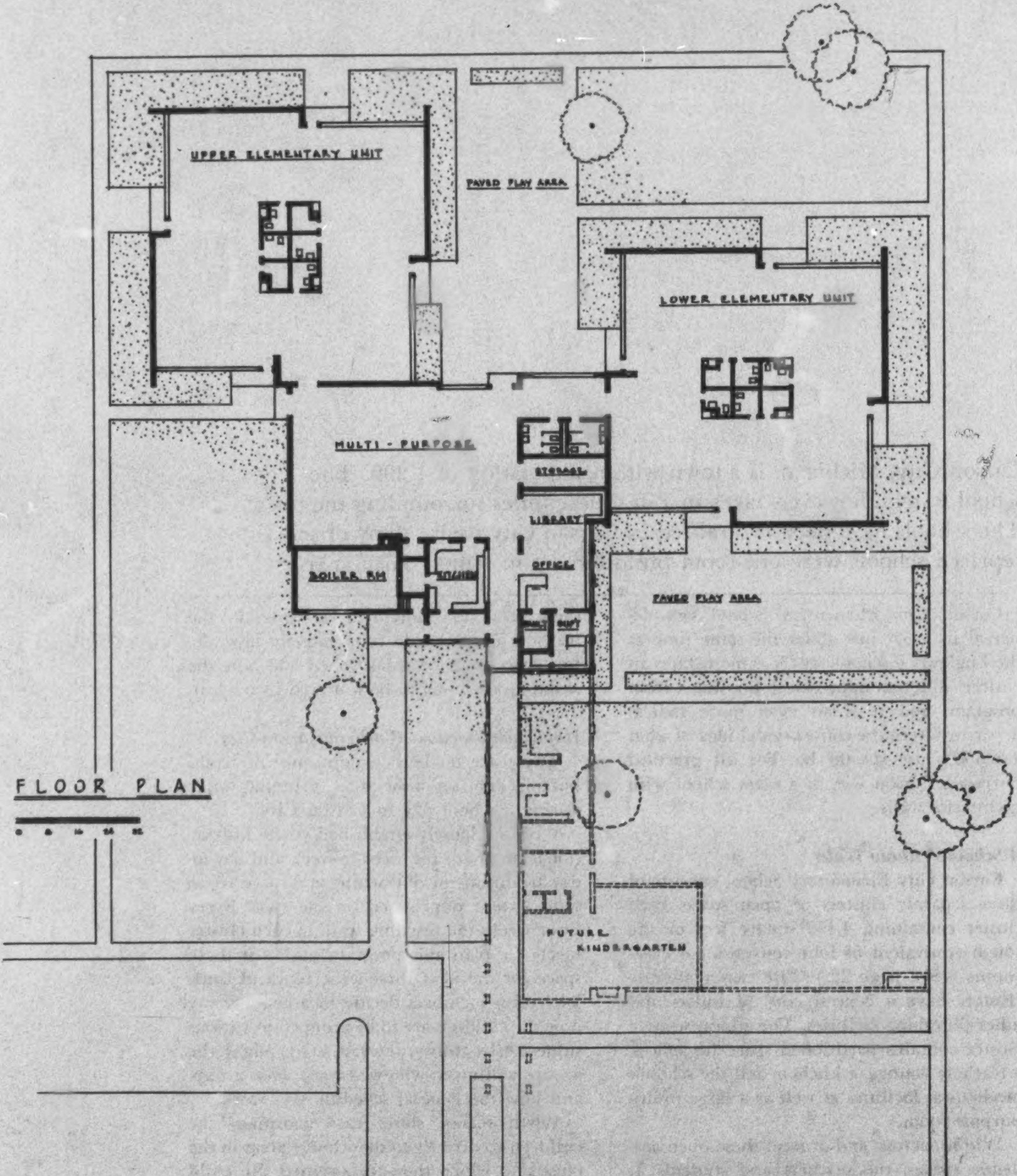
Within, across, and around these open academic spaces, the teachers and students at Carson City roam with almost total freedom. Like Englewood, this is a team school without a conventional grade organization. But since there are no individual classrooms, the teachers must decide cooperatively how the free space is to be apportioned and how the children are going to be scattered through it.

How Such Freedom Works at Carson City

There are no bells ringing, no intercoms buzzing, no set timetables grinding away during a school day in Carson City.

Within a loosely established yearly instructional program, the week-to-week and day-to-day arrangements of teaching and space are to some extent improvised on the spot. Every three weeks the teaching team in each cluster meets to plan the program and distribute space for the next three-week block of time. The team members decide in a general way how the children are to be grouped in various subjects (by ability, interest, etc.), where the groups will meet, who will teach what group, and how the general schedule will work.

When school starts each morning, the children go directly to their home areas in the cluster to which they are assigned. No child has a permanent desk; all furniture is completely movable. Each child has his own colored plastic "tote" tray containing his


UPPER ELEMENTARY UNIT
PAVED PLAY AREA
LOWER ELEMENTARY UNIT
MULTI - PURPOSE
STORAGE
LIBRARY
OFFICE
BOILER RM
KITCHEN
HEALTH SUIT
PAVED PLAY AREA
FUTURE KINDERGARTEN
FLOOR PLAN
0 8 16 24 32

crayons, books, pencils, etc. The children carry these about with them when they move, sliding the trays into slots beneath the tops of their new desks.

Throughout the day children and furniture move about quickly and quietly as directed. Groups change in composition and size as the teaching program dictates.

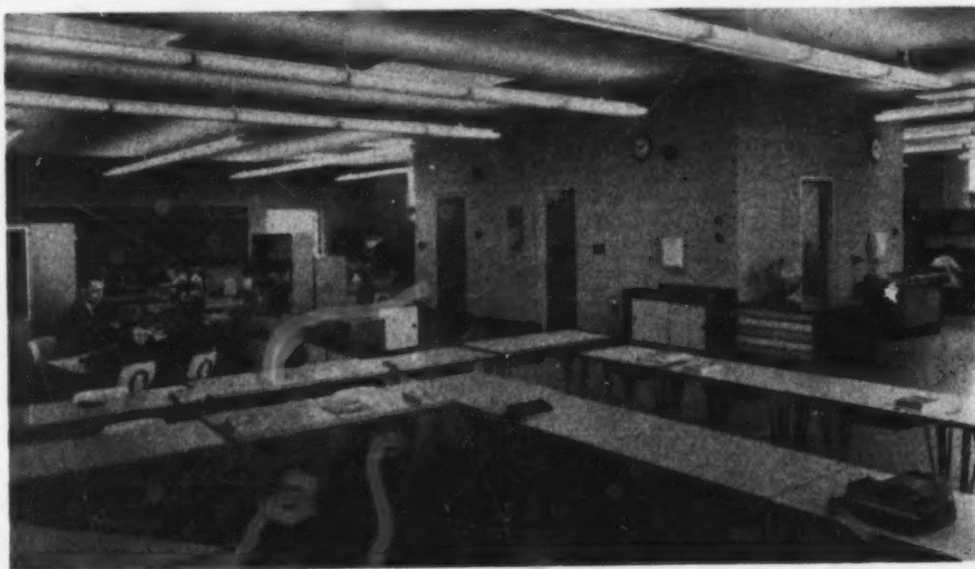
When a group breaks up, the children carry their trays with them and reassemble in another area, arranging chairs and tables in a new pattern for a new purpose. These moves take on the average no more than three or four minutes. Often this involves the formation of groups of up to 100 to hear a lecture or gather around dispersed television receivers. (Carson City receives elementary art and science programs from the Central Michigan Television Council stations in Bay City and Flint, Michigan.)

Television and lunch are the only fixed periods of the day. Certain groups must be in front of the television receivers at certain times to receive their television instruction. Lunch is served at two specified periods, cafeteria style, in the multipurpose room.

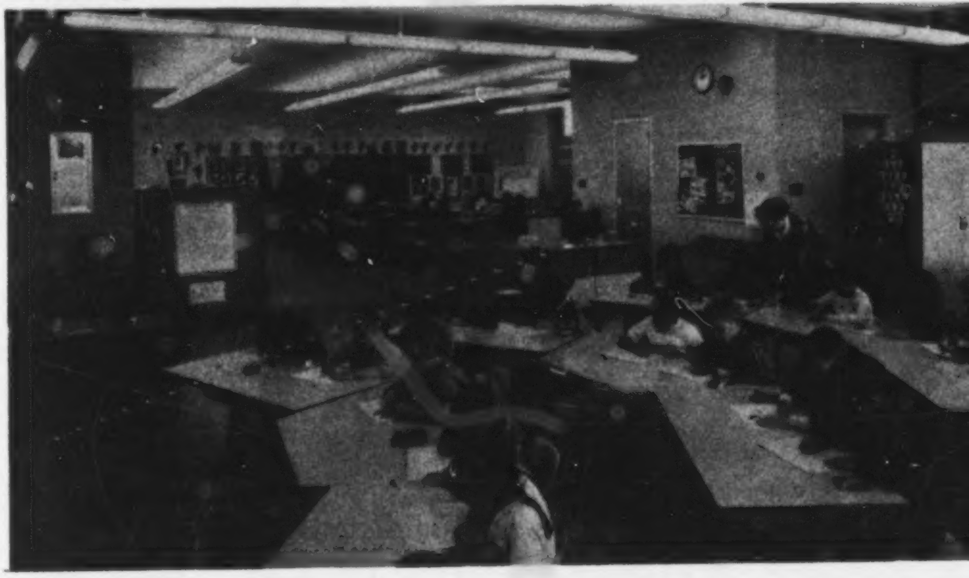
At 1:45 every afternoon there is a cluster meeting. Most of the children assigned to a cluster gather their chairs together, turning the cluster space into one large classroom. The team's master teacher holds a large group class involving questions and answers on one of the main teaching topics of the three-week period. About 10 of the children are not part of this large group. One of the teachers (freed by the large group class) spends part of this time working with these children in small group remedial or advanced work. After about 20 minutes these children return to the main group.

After the large group session, the group splits up and forms into smaller groups for art, committee work, etc., related to the topic discussed at the large group session.

At the end of each school day, the teacher team has a brief staff meeting (10 to 15 minutes) to review the day's work and make any necessary modifications in the teaching schedules or space arrangements for the next day.



The teaching areas at Carson City are broken only by movable storage units—the children adapt rapidly to the wide open academic spaces.



Every three weeks the teaching team in each cluster meets to plan the program for the next three weeks.

Large group classes, involving most of the students in a cluster, are held every afternoon.

Noisy Confusion

There is a certain amount of noise, but apparently it constitutes no insurmountable problem. Observers of the school report that the noise level, while greater than it would be in a school building divided into masonry cells, is largely confined to a continuous low background hum, interspersed only occasionally with sudden or distracting loud sounds. The ceilings are covered with fissured mineral wool acoustic tile, and all of the furniture legs are rubber tipped to help keep the racket of movement to a minimum. The children do have to assume more responsibility for keeping quiet than they might in a more conventional school building, but this does not seem to bother either the children or the teachers.

Observers also report that the constant flow of children through a cluster quickly becomes so common and accepted that the children pay no attention to it. Teachers must organize space so that a singing class is not scheduled a few feet away from a group doing quiet reading. But otherwise the teachers report no objections to the completely open plan.

The Building Itself

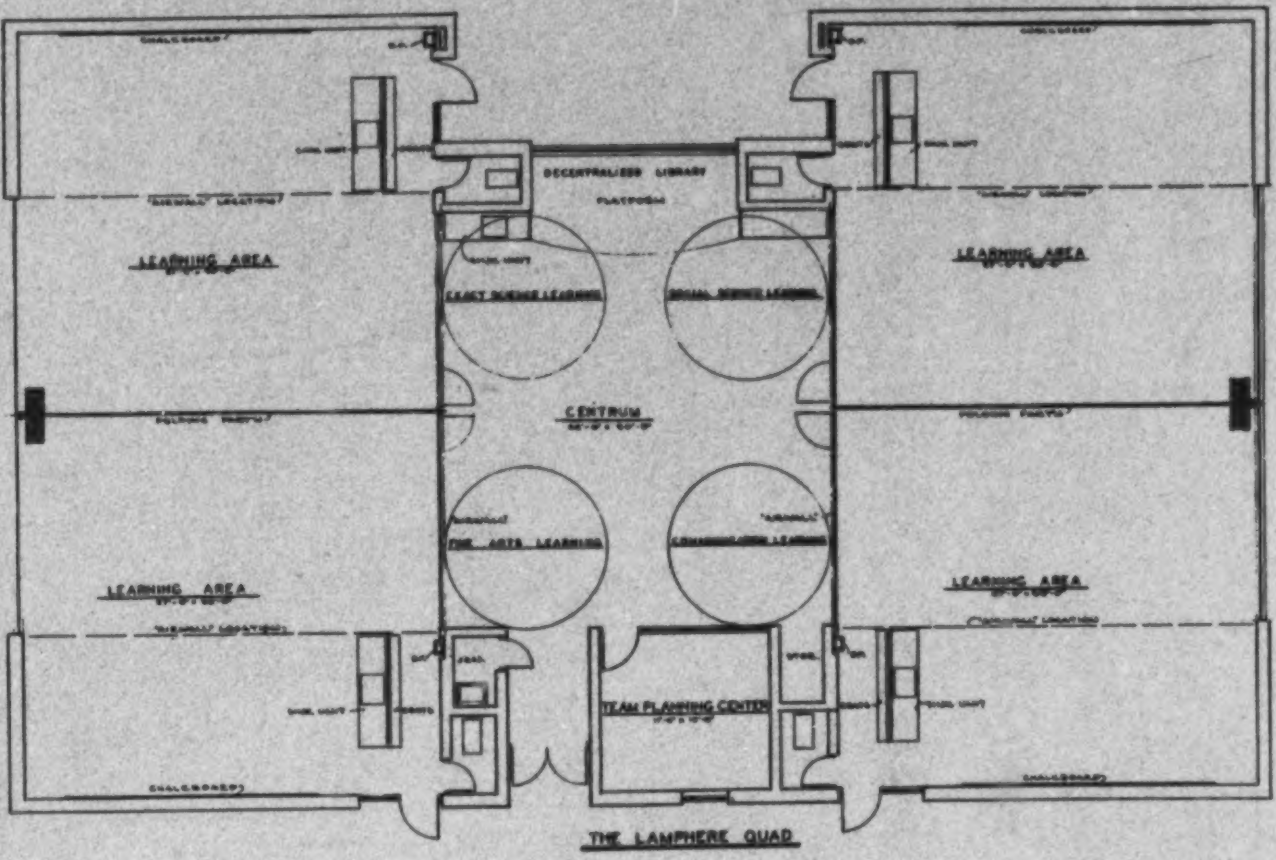
Apart from its novelty and its apparent success as a partitionless team teaching school, Carson City is a relatively straightforward, uncomplicated, economical schoolhouse. The three existing clusters are structurally repeated units. The school can be expanded by adding more clusters. Exterior walls are brick with generous areas of glass. The few existing interior walls are painted concrete block.

The three clusters contain 13,000 square feet of space. The building cost $180,000, or $13.85 per square foot. The cost per pupil, for 250 pupils, is $720.

Teams in Quads

Lessenger Elementary School
Two "Quad" additions
Lamphere Public School District
Madison Heights, Michigan

East Elementary School
Lamphere Public School District
Madison Heights, Michigan


DECENTRALIZED LIBRARY
PLATFORM
LEARNING AREA
EXACT SCIENCE LEARNING
SOCIAL SCIENCE LEARNING
LEARNING AREA
CENTRUM
LEARNING AREA
FINE ARTS LEARNING
COMMUNICATION LEARNING
LEARNING AREA
TEAM PLANNING CENTER
CHALKBOARD
THE LAMPHERE QUAD

SCHOOL: *Lessenger Elementary School*
Two "Quad" additions
Lamphere Public School District
Madison Heights, Michigan

OPENED: *September, 1960*

CAPACITY: *100-120 students in each quad*

SCHOOL: *East Elementary School*
Lamphere Public School District
Madison Heights, Michigan

TO OPEN: *September, 1961*

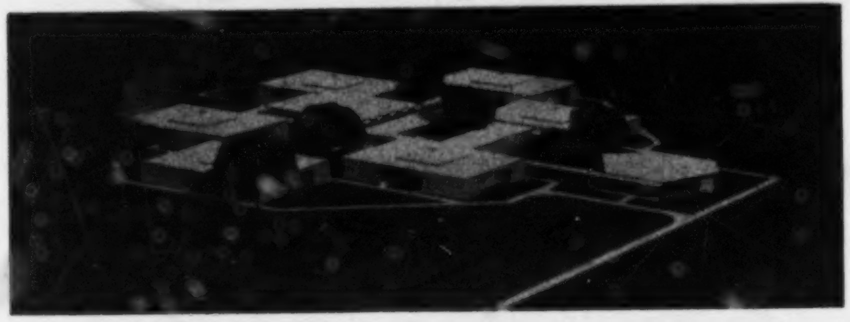
CAPACITY: *400 students, but expandable*
with the addition of more quads

SUPERINTENDENT: *Herbert E. Humbert, Jr.*

ASSISTANT SUPERINTENDENT: *Edward C. Pino*

ARCHITECTS: *H. E. Beyster & Associates*
Detroit, Michigan

Lessenger Elementary School



East Elementary School

Madison Heights, a suburb located four miles north of Detroit and incorporated only five years ago, now houses 33,000 people, mostly middle-income employees in Detroit offices and industries. The Lamphere Public School District includes three-fifths of Madison Heights and a small portion of the neighboring suburb of Troy.

The first teaching teams went into operation in the Lamphere School District during the fall of 1960, housed in what are probably the first elementary school units specifically designed to make team teaching work and—hopefully—work well.

The Lamphere teaching team differs from the teams at Englewood and Carson City. At Lamphere the team is more an association of equals. Team members are selected because of specific abilities in languages, social studies, science, fine arts, etc., and competence in group management, group dynamics, pupil assessment and diagnosis, planning, etc. An effort is made to have both men and women on each team as well as beginning, experienced, and career teachers.

The team leader's job is to convene meetings for planning and to guide the team so that leadership passes from member to member when a particular competence is in demand. Supervision thus becomes a function of the group through close association, cooperative planning, and mutual criticism, help, and responsibility. There is no supervisor, and the principal offers no supervision in the traditional sense of the word.

Teams in Quads

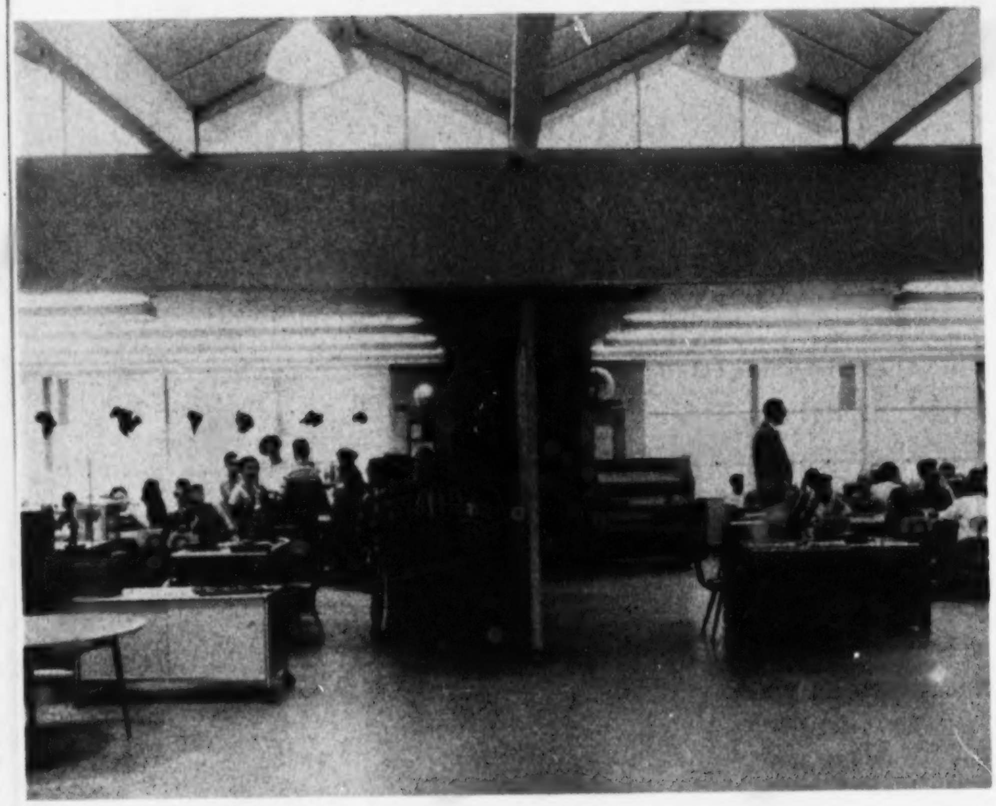
Each teaching team is housed in what Lamphere calls a "quad"—a cluster of four classroom spaces grouped around a central workroom and teaching area.

The greatest virtue of the quad is that it provides space that can, in theory, be adapted to any type of program (including a conventionally organized, self-contained classroom program). But at the same time the quad is uniquely suited to the housing and operation of a teaching team.

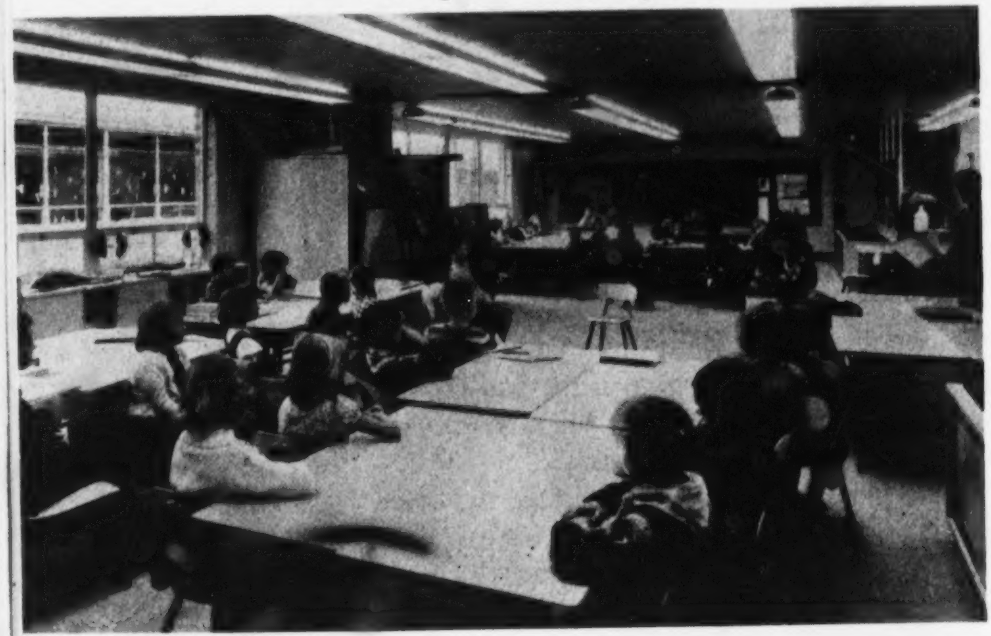
Each pair of neighboring classrooms is separated only by a manually operated, folding, wood partition, thus allowing for groups of as many as 120 children to be gathered in one place for lectures, films, demonstrations, or student drama productions.

The core of the clusters and of the team teaching program is the central material-resource, workroom-teaching area. Each of the four corners of this space is devoted to

Two learning areas are separated by a folding partition. The air walls which separate the learning areas from the workroom-teaching area are not in place.



When the partitions are folded back, the two learning areas operate as one large room.



The raised platform in the workroom area is used as

and equipped for a particular subject field —the science corner has sinks and demonstration materials; the fine arts corner has easels, paints, and a kiln; and so on. The workroom has a raised platform which serves as a decentralized library and as a stage. The room is used for large and small group and individual instruction and also serves as an area for the use of audio-visual aids, open- and closed-circuit television, and teacher-technician preparation of teaching aids.

Just off the central workroom is the quad's team planning center and conference room, which not only serves as a team headquarters but also provides a place where teachers can prepare their instructional materials.

Walls Held Up By Air

A further measure of adaptability is built into the Lamphere quad by the installation of movable "air walls" between the central material-resource, workroom-teaching area and the class areas.

An air wall is a series of 3½ foot by 8½ foot lightweight wood panels that fit tightly together and are held in place by an inflatable rubber rim running between the ceiling and the top of the panel. The rim is inflated by a small compressor supplied with each quad. When the rim is inflated, the wall is held rigidly in place. When the air is released, the wall can be easily taken apart and put up again elsewhere in the quad. This entire operation may be a little too complex to be

a decentralized library.

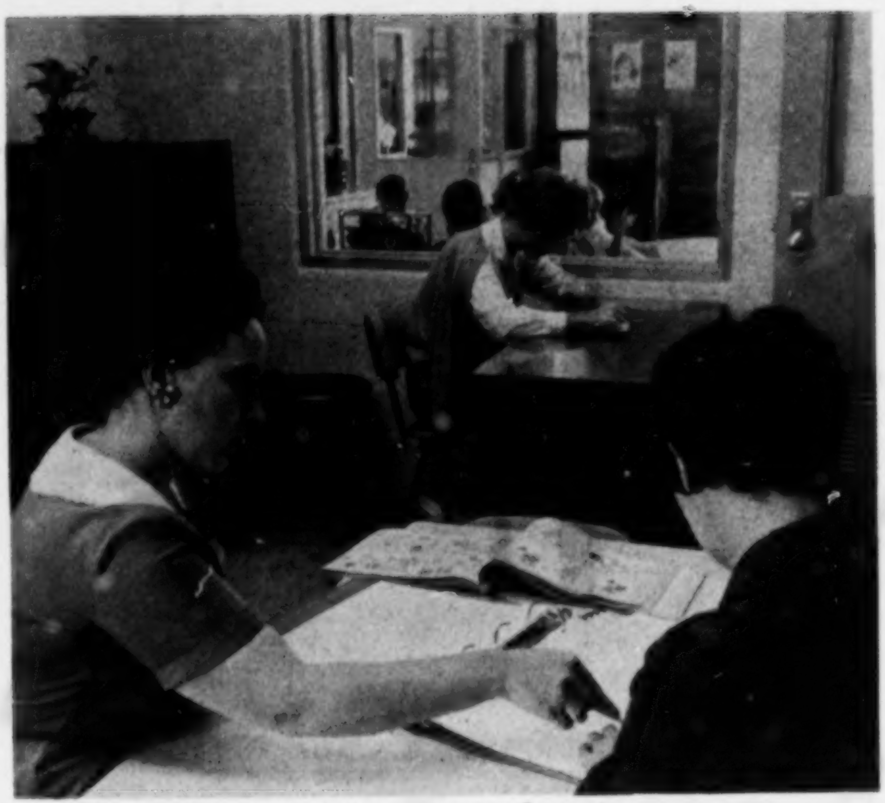
handled quickly during the school day, but one custodian can remove all four of the quad's air walls in about 20 minutes, or replace them in about 35.

This air wall system makes it possible to connect sections of the workroom with the learning areas or to open up the interior space of the entire quad if this seems desirable. Air walls offer acoustic privacy equal to a 3 inch concrete block wall.

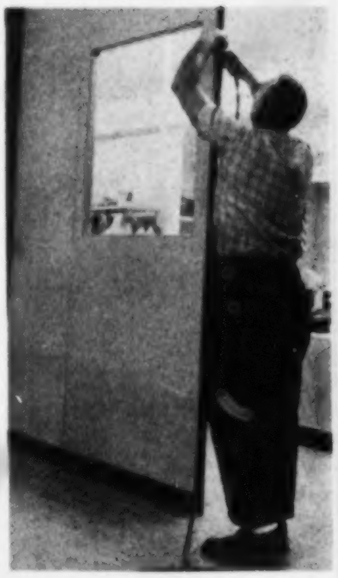
Construction of a Quad

The first two quads in the Lamphere district were opened in September, 1960, as additions to the Lessenger Elementary School. These quads, except for their unusual spatial arrangements, are fairly conventional buildings. The footings, foundations, and floors are reinforced concrete. A structural steel frame, with the assistance of a few interior walls and four interior columns, supports a fiber composition roof deck (at East Elementary School the roof deck is metal). Exterior walls are non-load-bearing brick and glass. Because there are few interior roof supports, the space inside the building is relatively free, and this makes possible the quad's adaptable arrangement of educational space.

A pipe tunnel running beneath the concrete floor carries the utility ducts and pipes. Flooring is asphalt tile except in toilets and service areas where ceramic tile is used. There is no provision in the heating and ventilating system for air conditioning.

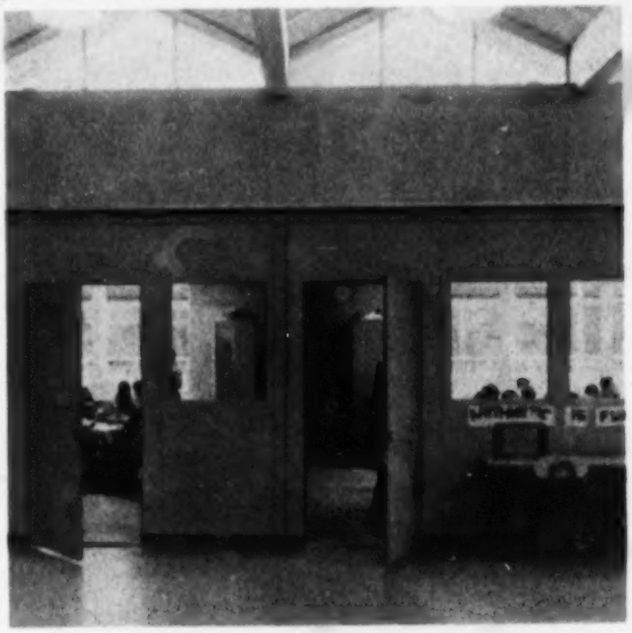


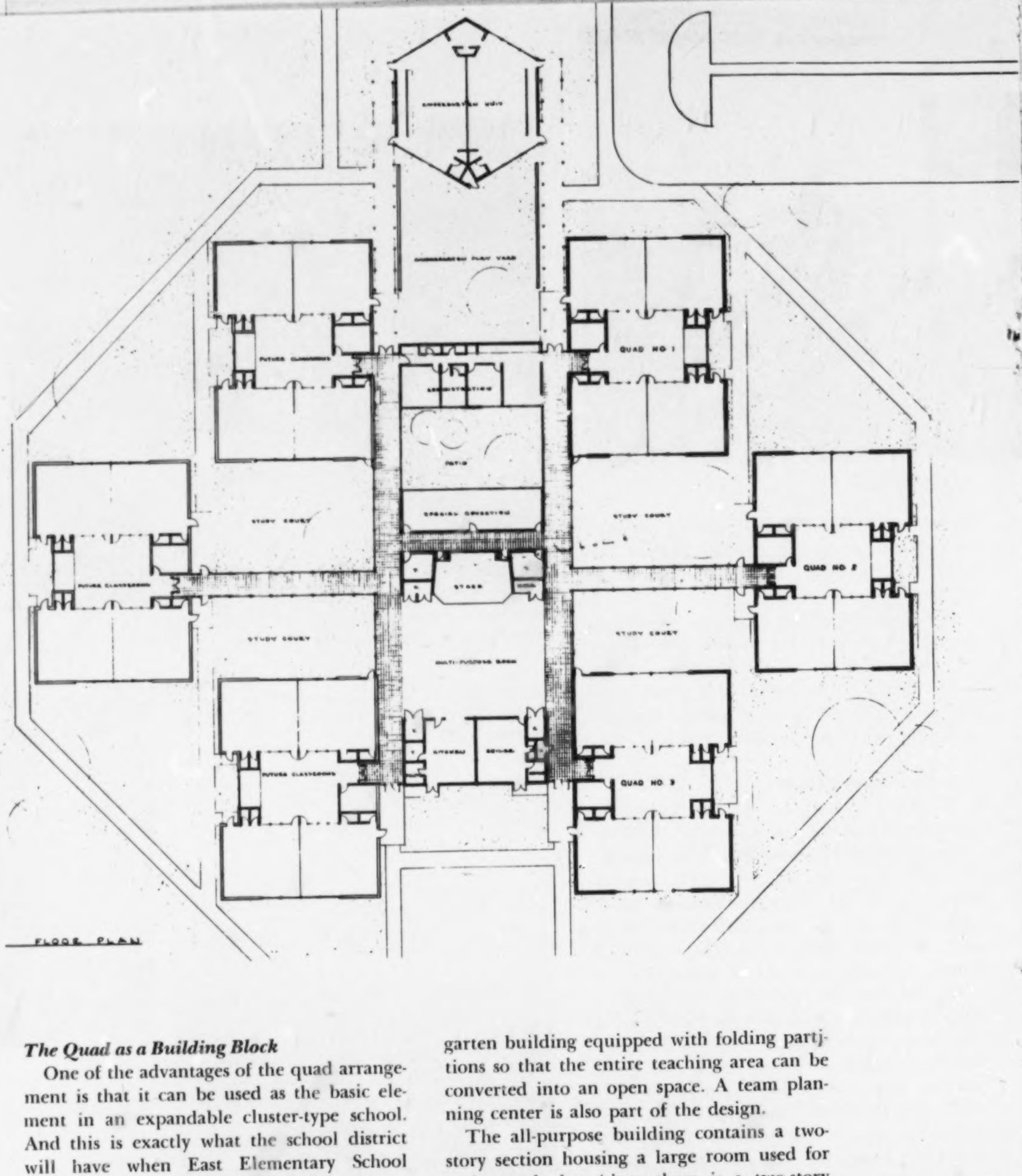
Teachers use the team planning center for the preparation of instructional materials.



The air walls can be put up anywhere in the quad, providing the ceiling is unobstructed, reinforced, and the same height.

The air walls separate the self-contained learning areas from the central workroom area.




KINDERGARTEN UNIT
KINDERGARTEN PLAY YARD
FUTURE CLASSROOMS
QUAD NO. 1
ADMINISTRATION
PATIO
SPECIAL EDUCATION
STUDY COURT
STUDY COURT
FUTURE CLASSROOMS
STAGE
QUAD NO. 2
STUDY COURT
STUDY COURT
MULTI-PURPOSE ROOM
KITCHEN
BOILER
FUTURE CLASSROOMS
QUAD NO. 3
FLOOR PLAN

The Quad as a Building Block

One of the advantages of the quad arrangement is that it can be used as the basic element in an expandable cluster-type school. And this is exactly what the school district will have when East Elementary School opens in September, 1961. (above)

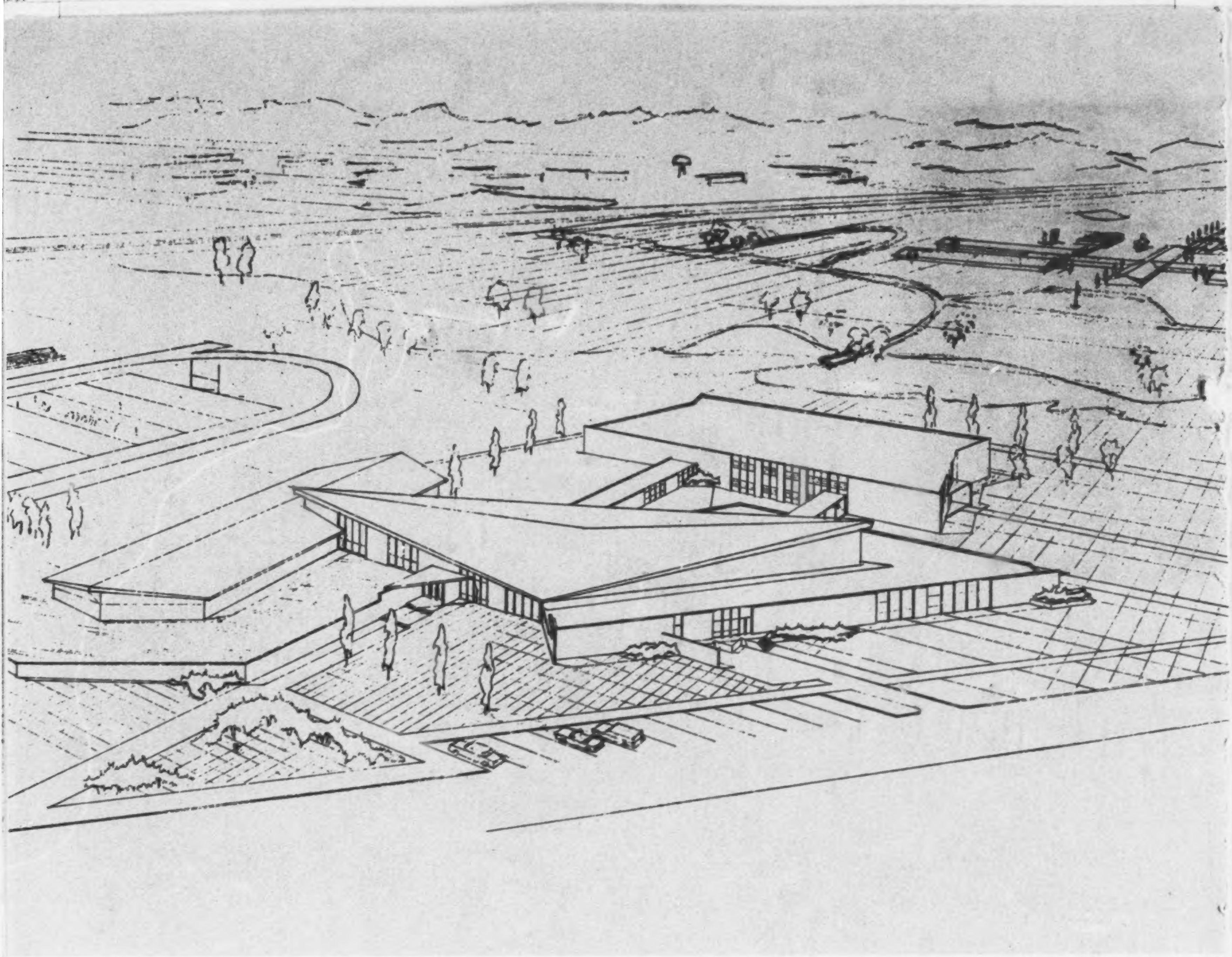
The school's three quads and an all-purpose building are arranged around two central study courts. Appended to one of the quads is an administration wing. Off to one side is the hexagonal, two-classroom kindergarten building equipped with folding partitions so that the entire teaching area can be converted into an open space. A team planning center is also part of the design.

The all-purpose building contains a two-story section housing a large room used for eating and also (since there is a two-story stage area) for assemblies and large group sessions. The school's mechanical facilities, the library resource center, the kitchens, and rooms for special education are also housed here.

Two Team Schools Going Up

Marie Creighton Junior High School
Jefferson County, Colorado

Grove Street Elementary School
Lexington, Massachusetts



School: *Marie Creighton Junior High School*
Jefferson County, Colorado

To Open: *September, 1961*

Capacity: *750 students*

Grades: *7-9*

Superintendent: *Robert H. Johnson*

Architects: *Musick and Musick*
Denver, Colorado

Educational Consultants: *Educational Planning Service*
Colorado State College
Greeley, Colorado
Leonard C. Walsh
Glendon P. Nimnicht
James M. Thrasher

Marie Creighton Jr. High School

Jefferson County is an area of 791 square miles just west of the Denver city line. It thus includes not only suburban schools near Denver but encompasses two-teacher rural schools 30 miles up into the Rocky Mountains. Its total population was 55,687 in 1950 and is now 127,645. The school population has grown from 23,000 in 1958 to about 30,000 in 1960.

Marie Creighton Junior High School will house two unusual experiments in the arrangement of space:

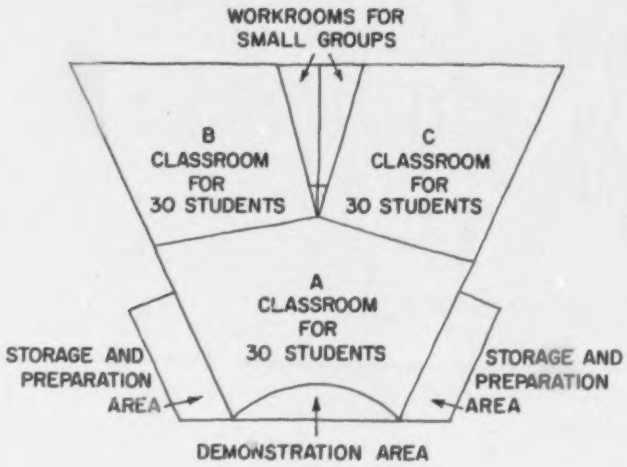
- A group of three classrooms arranged as a trapezoid to form a team "triad."
- A little theater seating 100 students, which can be expanded to a 400 seat auditorium by sliding back a movable partition and joining the theater to the adjacent cafeteria.

Teams In Formation

Jefferson County has no teams in operation yet at the junior high level, and Marie Creighton will open with a conventional program. But the triads have been designed so that team teaching can quickly be put into practice at any time.

In a triad (see page 34), the 30 students in each of the three classrooms can be joined into a larger group of 60 or 90 students with-

A team triad.

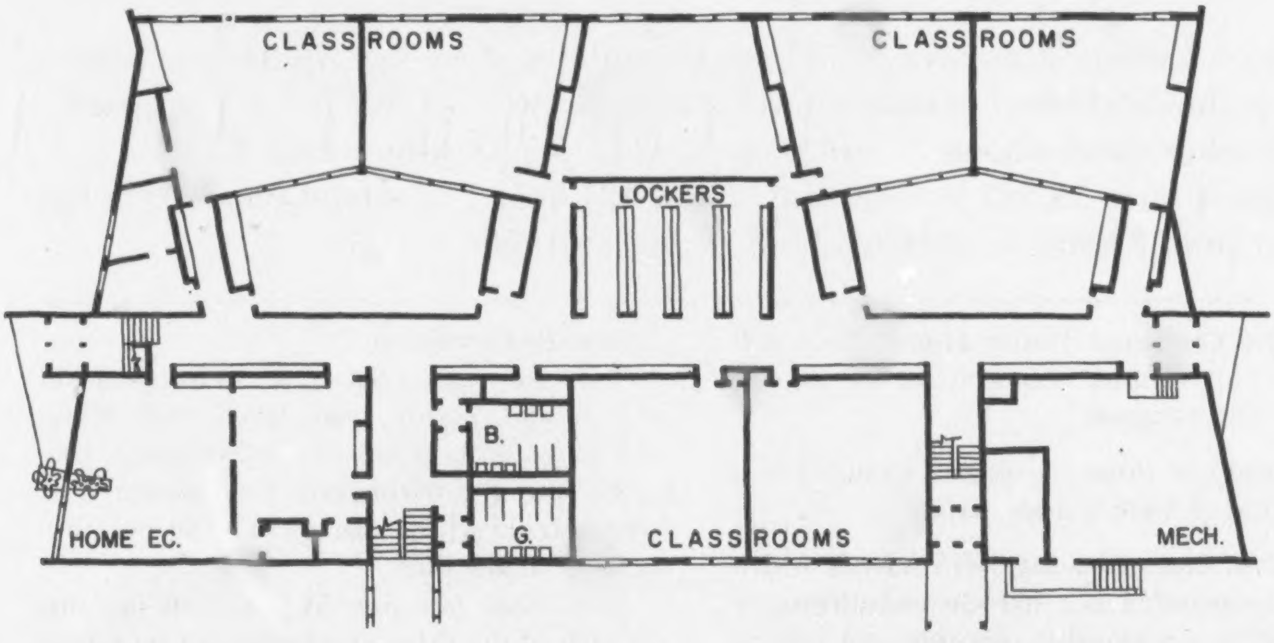

WORKROOMS FOR SMALL GROUPS
B CLASSROOM FOR 30 STUDENTS
C CLASSROOM FOR 30 STUDENTS
A CLASSROOM FOR 30 STUDENTS
STORAGE AND PREPARATION AREA
STORAGE AND PREPARATION AREA
DEMONSTRATION AREA

out moving any walls.

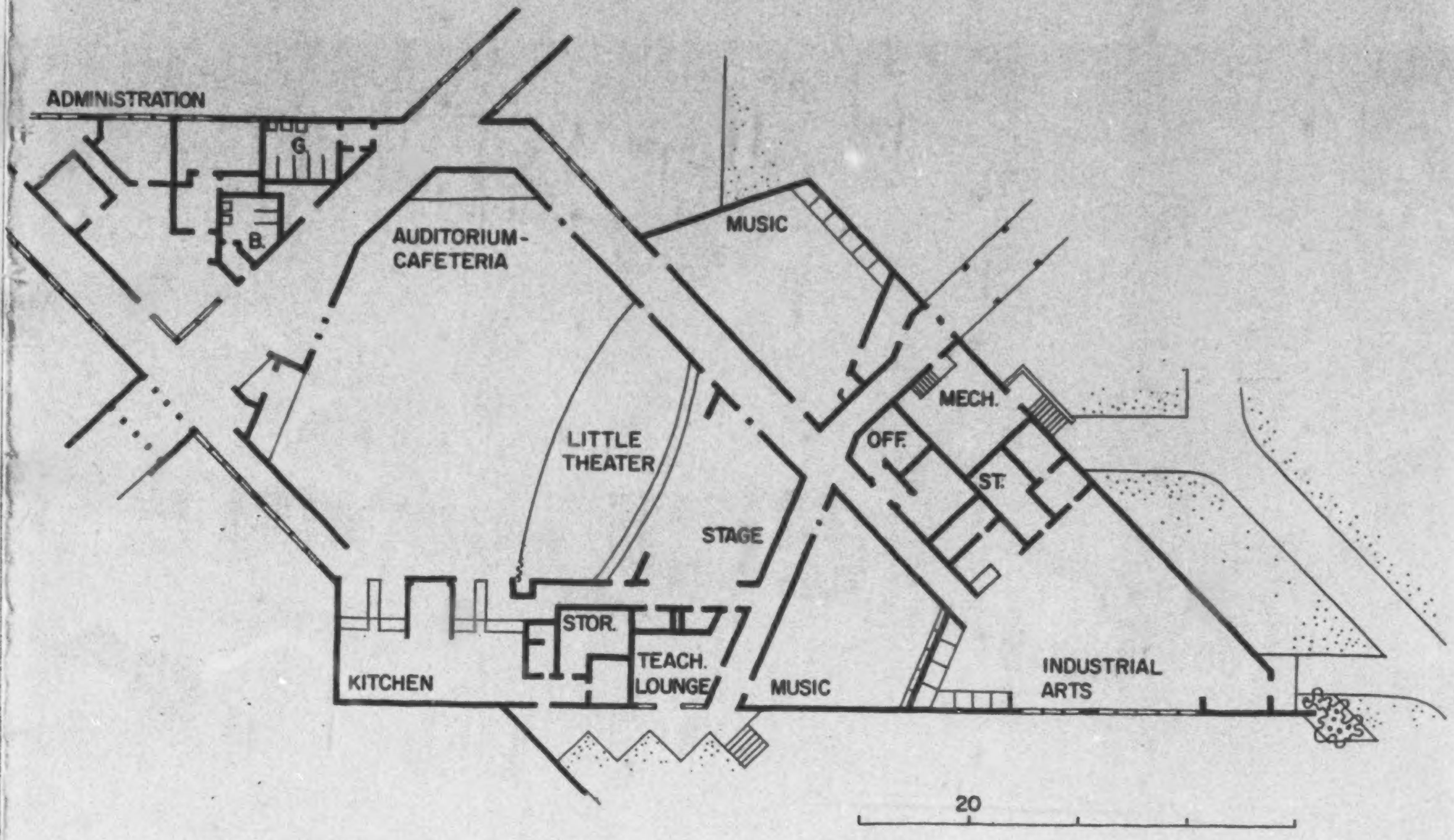
The partitions between room A and room B and between room A and room C will be glass which can be covered by curtains. With the curtains closed, each room is a self-contained classroom. With one of the curtains open, the 30 students in B or C will be joined with the 30 students in A to become a group of 60 looking at a film or demonstration on the stage in A. With both curtains open, the group will become 90. Sound will be transmitted among the rooms by means of a two-way intercom system.

Originally, the educational consultants specified that the floor of room A was to be lower than the B and C floors. This was to make sure that the students in B and C could see over the heads of the students in A. But the architects were not able to provide this, in part because cost factors necessitated a two-story building, which in turn made different room levels too difficult and expensive. It is true, too, that while teachers can move fairly easily from room to room, the glass walls do not allow the easy regrouping of students between the classrooms. However, the glass-wall-between-rooms design is not final. If during building a good sound-retardant operable wall is developed, it may be substituted for the glass wall.

The second innovation at Marie Creighton is the convertible cafeteria-auditorium which provides the school with space that can be used for large group instruction or all-school assemblies.


CLASSROOMS
CLASSROOMS
LOCKERS
B.
G.
HOME EC.
CLASSROOMS
MECH.

The triad classroom section.


ADMINISTRATION
G.
B.
AUDITORIUM-CAFETERIA
MUSIC
LITTLE THEATER
STAGE
MECH.
OFF.
ST.
KITCHEN
STOR.
TEACH. LOUNGE
MUSIC
INDUSTRIAL ARTS
20

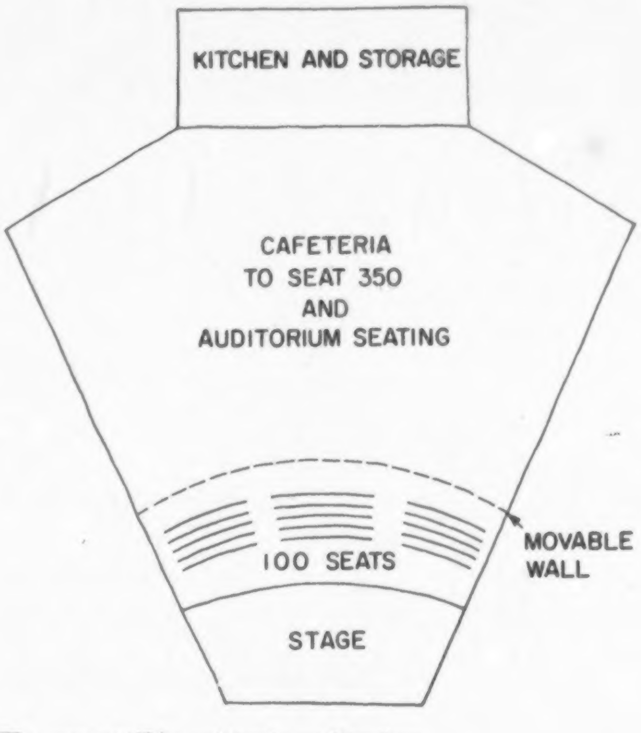
The cafeteria-auditorium fits in an unusual way into its roughly diamond-shaped building.

The 100 seat little theater, in this case, *is* lower than the flat-floored cafeteria level. When the movable wall is rolled back and seats are appropriately arranged in the cafeteria, the students there have a better chance of seeing over the heads of the students in the little theater than they would if the entire floor were on the same level.

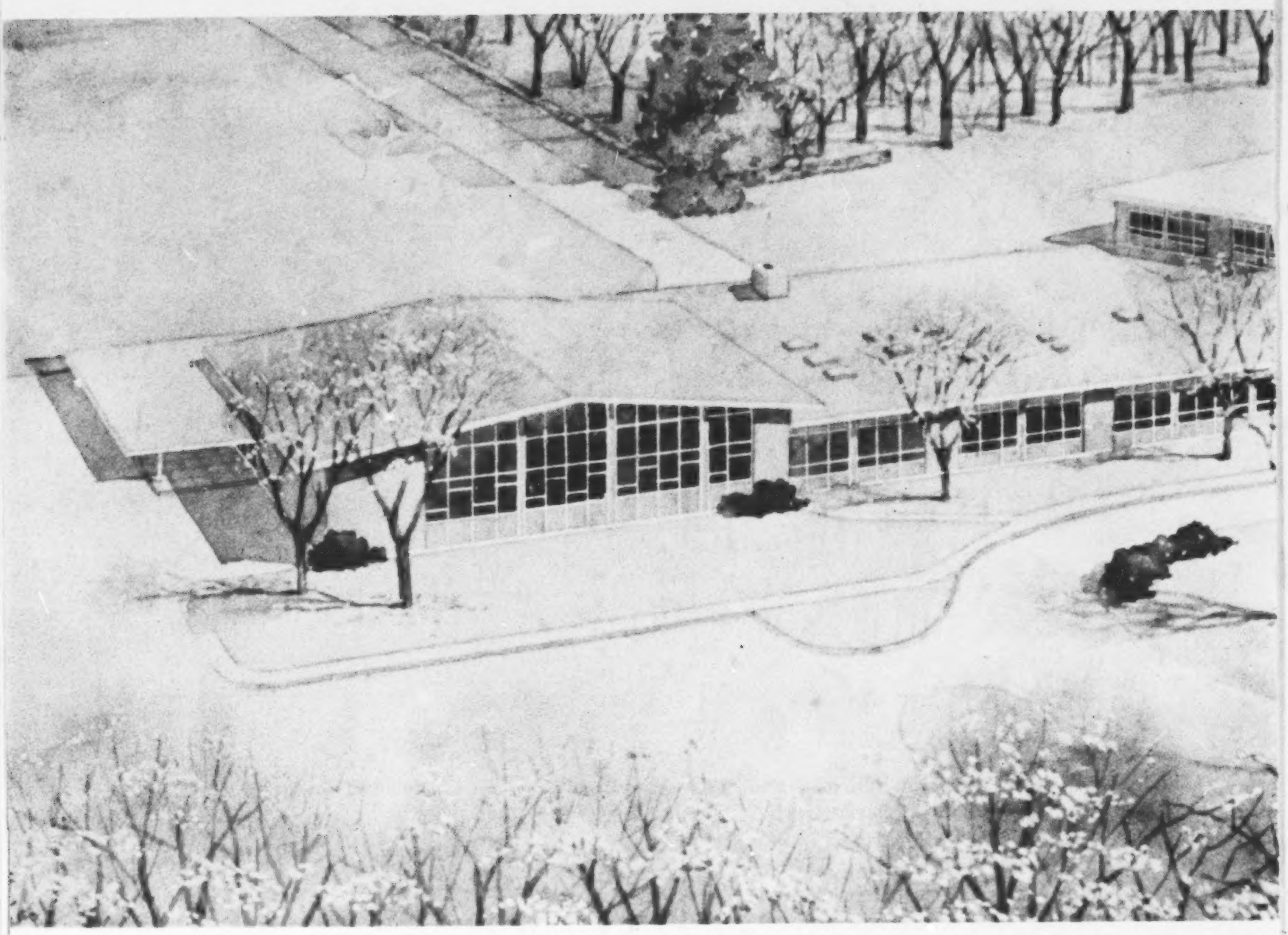
Cost

Marie Creighton was bid in at $913,626, including all costs except those of site and movable equipment. The school contains 62,824 square feet of space, thus yielding a cost per square foot figure of $14.54.

Since the school was designed to open with 750 students, this means a per pupil cost of $1,218. But, as in the case of Englewood, the first stage of the school contains all of the basic facilities for a 1,000 pupil school. All that need to be added are three classroom triads. Thus the final per pupil cost will be somewhat lower.

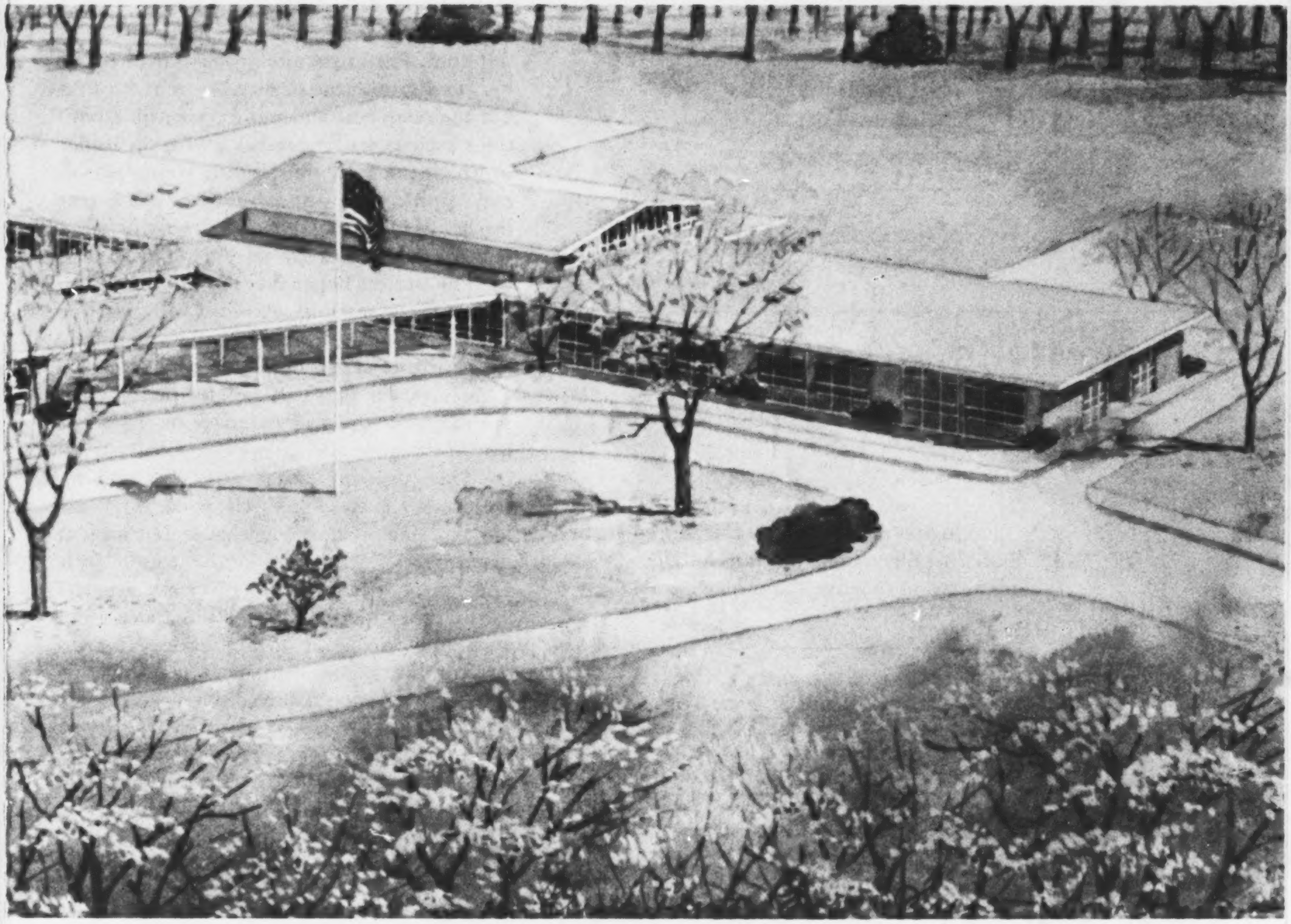

KITCHEN AND STORAGE
CAFETERIA
TO SEAT 350
AND
AUDITORIUM SEATING
100 SEATS
STAGE
MOVABLE WALL

The convertible cafeteria-auditorium.



SCHOOL:	*Grove Street Elementary School* *Lexington, Massachusetts*
TO OPEN:	*September, 1961*
CAPACITY:	*650 students*
GRADES:	*1-6*
SUPERINTENDENT:	*Medill Bair*
ARCHITECTS:	*Clinch, Crimp, Brown & Fisher* *Boston, Massachusetts*
EDUCATIONAL CONSULTANTS:	*Kargman, Mitchell & Sargent* *Cambridge Consultants, Inc.* *Cambridge, Massachusetts*

Grove Street Elementary School,

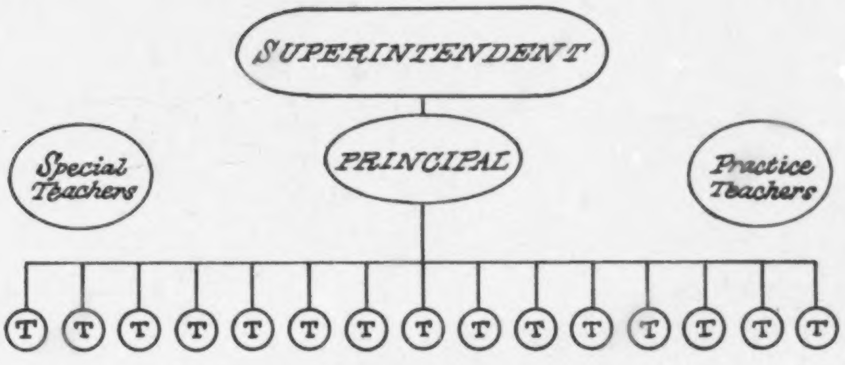


Lexington, Massachusetts, the ancestral home of the Minute Men, is a suburb of 27,900 people, 13 miles west of Boston. The community is now made up largely of middle- and higher-income professional people, including university professors and Boston businessmen as well as scientific researchers and industrial managers who work in the new industries springing up along Route 128, west of Boston.

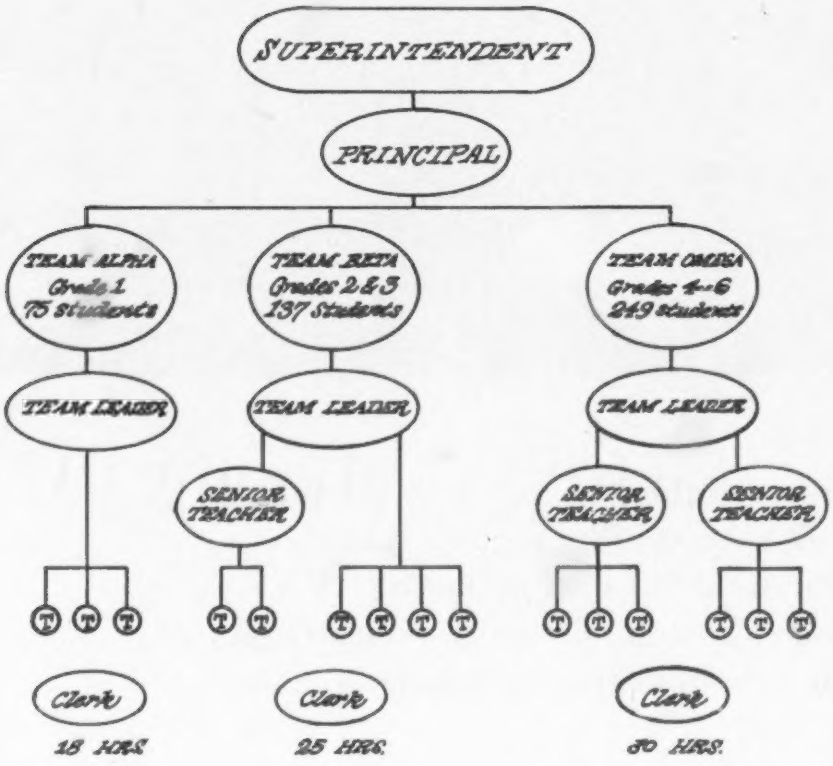
Englewood and Carson City were among the first schools in the country to experiment with team teaching, but the first elaborate and highly organized team project involving an entire school began in Lexington, Massachusetts, in September, 1957.

This project was sired by an organization called SUPRAD (School and University Program for Research and Development), an alliance between Lexington and two nearby Massachusetts communities and Harvard University's Graduate School of Education.

Instead of the conventional school organization:


SUPERINTENDENT
Special Teachers
PRINCIPAL
Practice Teachers
T

Lexington and SUPRAD introduced at the Franklin Elementary School in 1958-59 an organization roughly like this:


SUPERINTENDENT
PRINCIPAL
TEAM ALPHA Grade 1 75 students
TEAM BETA Grades 2 & 3 137 Students
TEAM OMEGA Grades 4-6 249 students
TEAM LEADER
TEAM LEADER
TEAM LEADER
SENIOR TEACHER
SENIOR TEACHER
SENIOR TEACHER
T
Clerk
18 HRS.
Clerk
25 HRS.
Clerk
30 HRS.

In the minds of Lexington and SUPRAD, this kind of organization is in no way intended ". . . to diminish the status of regular teachers but to create new and more responsible positions such as senior teacher and team leader to which the truly outstanding young person may aspire, and through which the career teacher of high competency and responsibility may be more fittingly rewarded by society.

"The project hopes that the building principal and the teachers who lead will, over the years, constitute a relatively stable and permanent corps of career officers in education. To a great extent this will protect pupils from the effects of the staff turnover so characteristic of teaching.

"This corps of leaders supervises and instructs (by example as well as directly) the less experienced and somewhat more transient teachers who work within the teams. It is also hoped that the corps of career teachers can offer a superior kind of preservice guidance and instruction to apprentices, interns and subprofessional workers. Thus it may be that team teaching will lead to new approaches to teacher education."*

Although this project was designed primarily to improve teacher utilization and professional status, the experiment is designed as well to improve the education that Robert and Mary receive. Under the present Franklin School team organization, Robert and Mary would be taught by members of the Omega team. They would be divided into their various large and small groups as their achievements, needs, or interests dictated. They would each receive, more nearly than they would in a conventional school, the education best suited to them as individuals.

Is the Project a Success?

Although the team teaching project has been under way now for three years, Lexington and SUPRAD still refuse to pronounce it a success or a failure. It will be another five years before all of the results of the experiment are in and are properly evaluated. But

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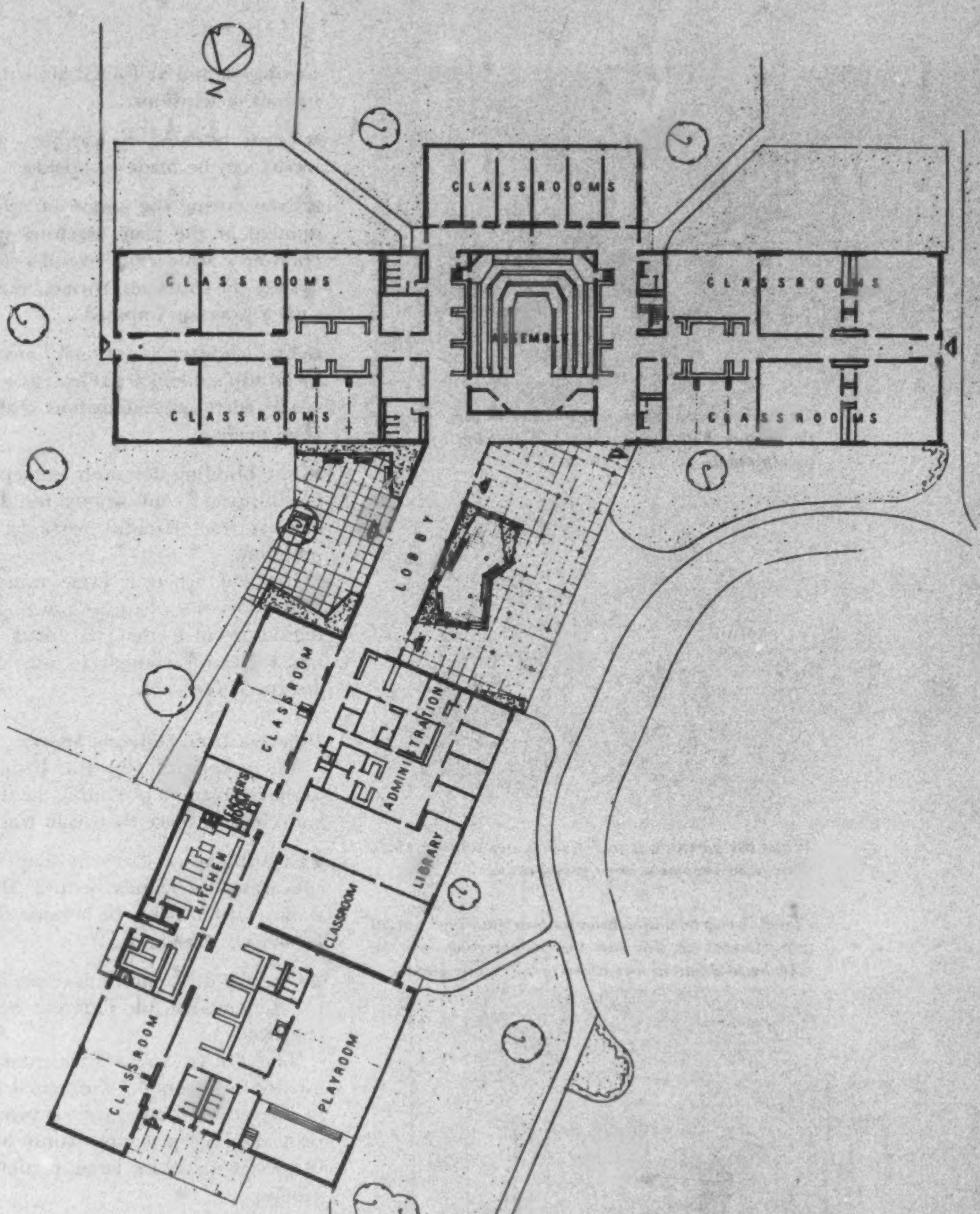
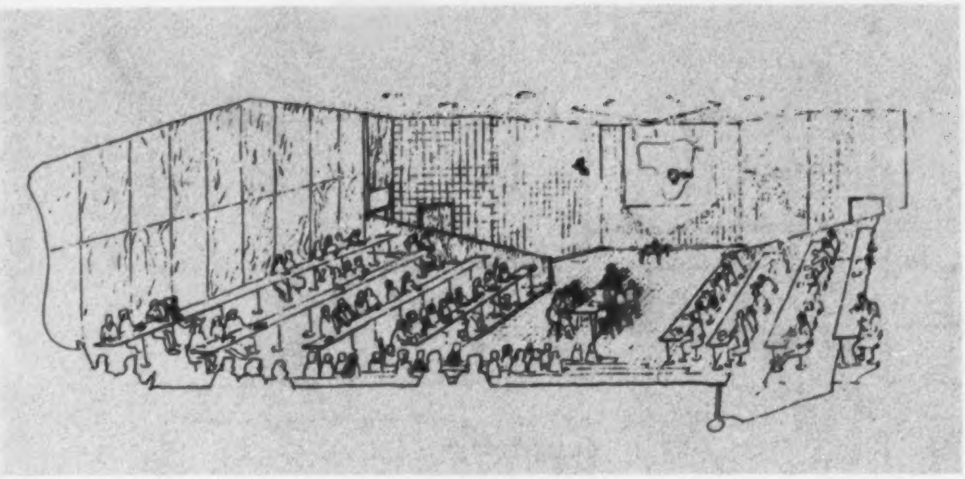
*Robert H. Anderson, "Team Teaching in Action," *The Nation's Schools*, May, 1960, p. 65.

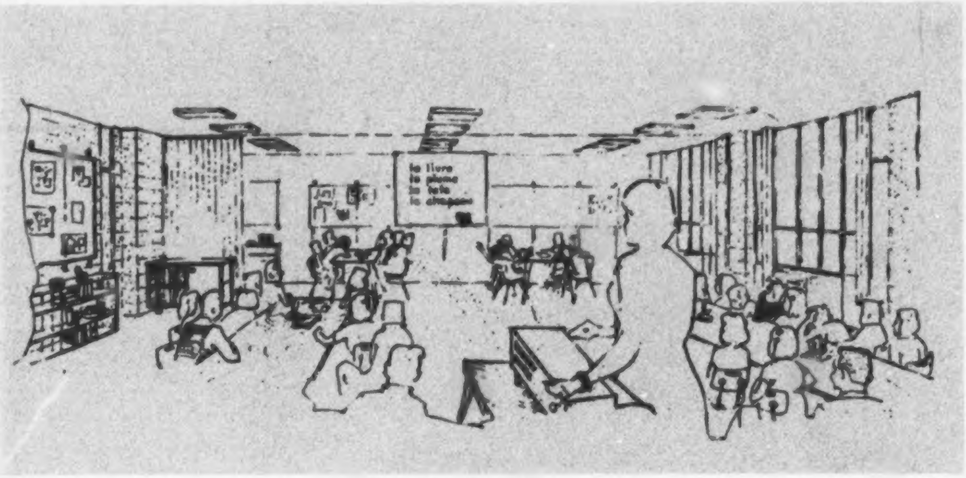

N
CLASSROOMS
CLASSROOMS
CLASSROOMS
ASSEMBLY
CLASSROOMS
CLASSROOMS
LOBBY
CLASSROOM
ADMINISTRATION
TEACHERS ROOM
KITCHEN
LIBRARY
CLASSROOM
CLASSROOM
PLAYROOM

FLOOR PLAN

0 10 20 30 40 50

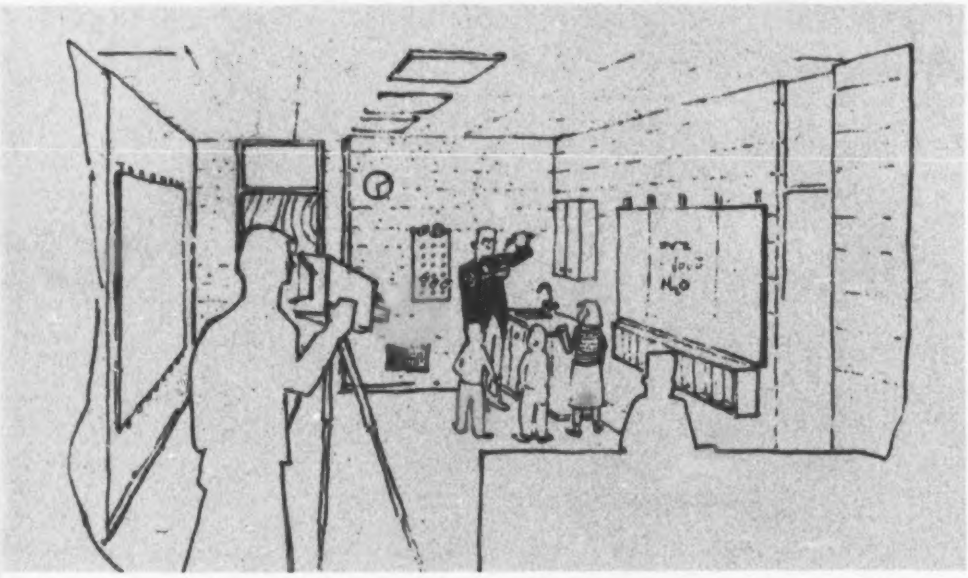


The raised tier arrangement of seats on three sides of the lecture hall permits the easy viewing of visual presentations.



When the partition is folded back, two self-contained classrooms become a large group room.

Closed-circuit television broadcasts originating in small group rooms—in this case the science room—can be seen by students in any other room in the school.



Lexington and SUPRAD are willing to stand by four conclusions.

- Team teaching is feasible—a theoretical model can be made to operate.
- Even during the period of trial and development of the team teaching program, the children's achievement results did not suffer despite the shifts and turmoil that instituting such a program imposed.
- The children's personal, emotional, and social adjustments are at least as good as before—and there are indications that gains have been made.
- The building definitely influences program possibilities; a conventional building operates against the efficient working of a team program.

In 1959, when it came time to add an elementary school to the town's system, Lexington decided that the team experiment was successful enough to warrant a school designed to serve it.

Different Uses, Different Spaces

There appear to be two basic approaches to the problem of providing the different sizes and kinds of space that team teaching needs:

- Creating space that can adapt to different educational demands because there are no walls (Carson City) or because the walls can be moved (Englewood).
- Creating different kinds of permanent space to accommodate the different needs of team teaching.

The Grove Street Elementary School is essentially a school of the second kind.* Some of its walls will move, but it provides for the team teaching program mainly by the design of special spaces for large, regular, and small groups.

Large Group Spaces

The most elaborate large group space at Grove Street is the assembly-lecture hall seating up to 200 students in a semicircular pattern. The children will sit at long fixed tables placed on raised tiers. This room is especially designed for all kinds of large group instruction: demonstrations, presentations, and some kinds of discussions. It will be equipped with overhead projectors, film projectors, and large screen, closed-circuit television. The room is completely enclosed, and special ventilation and lighting will be provided.

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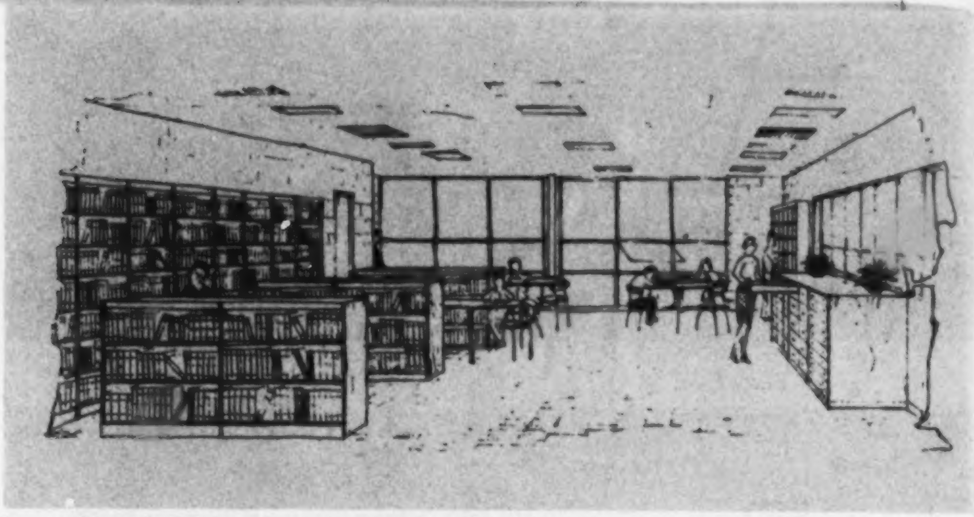
*As is Wayland Senior High School, Wayland, Massachusetts, which was planned by the same educational consultants.

A second kind of large group space is provided in two large, divisible classrooms designed to hold 80 to 100 children. Each of these rooms can operate either as independent, 900 square foot classrooms, or, when a vinyl accordion partition is open, as a single room of 1,800 square feet. There will be sinks and storage space for art and science work. The furniture will consist of movable tables and chairs, and at lunchtime these rooms will become the cafeteria, which is why they flank the kitchen.

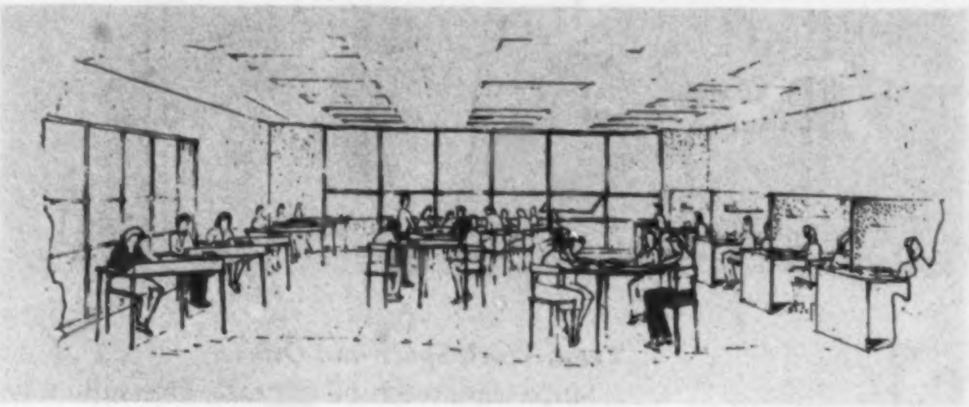
Small Group Spaces

The Grove Street School provides two kinds of smaller group space, each designed for a different small group function.

Directly behind the large group assembly hall are six nondivisible rooms of 400 square feet each. These rooms will be used for groups of from 10 to 20 children. In addition to tables and chairs, each of these rooms will be equipped with instructional materials and devices that go with a particular subject—laboratory and demonstration equipment for science, maps and pictures for social studies, and so on. Each room with its special equipment can be used not only for small group work but also as a television studio for instruction in that particular subject. Programs will originate in the small group rooms and will be broadcast over a closed-circuit television system to the large group assembly hall or to any other room in the school. This eliminates the need to trundle demonstration and teaching equipment all over the building. It also means that the same program can be beamed to classes in different parts of the school at the same time. It is hoped that a complete television studio equipped with closed-circuit transmitter, video tape recording equipment, and studio space will eventually be housed in the basement beneath these small group rooms.



Grove Street's library is a step in the direction of a true material-resource center.



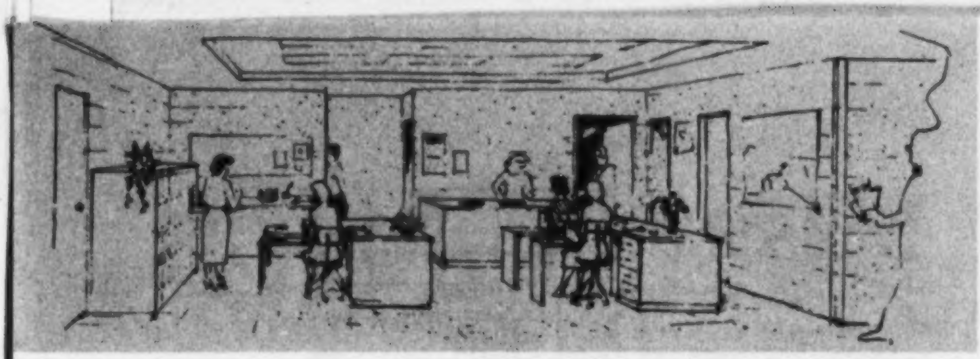
The individual study room adjacent to the library provides booths for listening to tapes as well as the usual reading room tables and chairs.

The second kind of small group space is provided in four conventionally sized rooms flanking the large assembly room. Each of these rooms contains 900 square feet but can be divided at will by a pair of accordion partitions into three, 300 square foot rooms suitable for seminar meetings of 10 to 15 students.

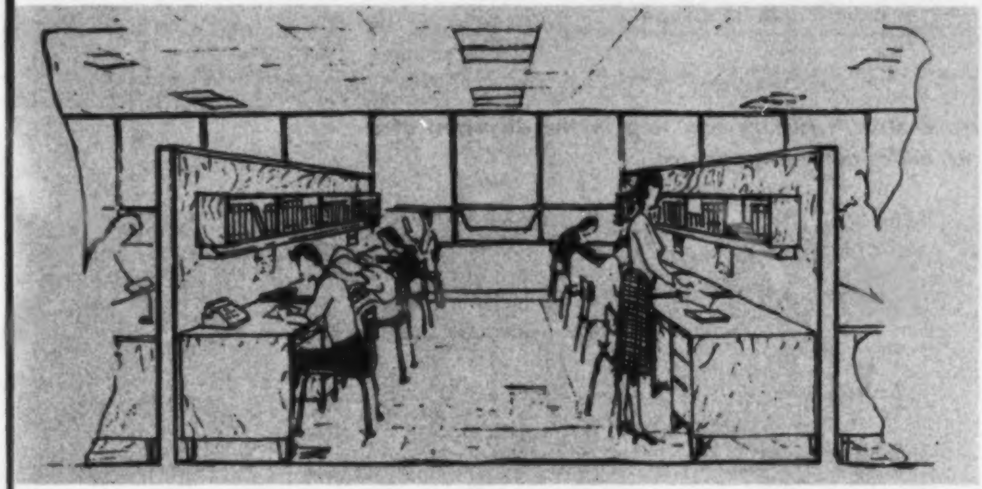
Individual Study

The team program puts an unusually large responsibility upon the students to accomplish part of their education on their own. Robert and Mary would both be able to spend some of their time in the school library and its neighboring, individual study area.

The library will be the main repository for books, tapes, recordings, magazines, etc., while the individual study room will be equipped with space for reading and booths for listening to tapes.



Teachers prepare their instructional materials in a special, centrally located workroom.



In addition to the centrally located workroom, each team has its own office.

Team Work Space and Offices

Since team teaching radically alters the way teachers operate, it also alters radically the spaces they need for their teaching. Because large classes often require the extensive use of visual aids (and because all good teaching requires elaborate planning), the design calls for a centrally located teachers' workroom.

Here teachers will have materials for making slides and transparencies for large screen projection and tape recordings for language work, a teachers' library, a storage place for films, and any other materials and devices that might aid the instructional process. The clerical aides will be quartered in this area, too.

In addition, each team will have its own team office where teachers can perform their own work (lesson planning, evaluation, etc.) and team members can confer.

A Reconvertible School

One feature of Grove Street's design bears mentioning, although it can be viewed as either an advantage or a drawback.

Although the school was designed around an existing team program it also had to be designed to work for a conventional school program. This reservation was desired by the school system to cover the possibility that the team teaching experiment might not prove successful. In case the experiment does fail, the teaching spaces in Grove Street can be converted into 23 self-contained, 900 square foot classrooms for a total of $18,000. Under this arrangement the large group assembly room would become an auditorium.

Construction and Cost

In its general construction, Grove Street Elementary School is a conventional building. The framing is structural steel which supports a roof deck of precast concrete slabs. The exterior walls are concrete block faced with brick. Interior partitioning (where movable partitions are not used) is concrete block with some surfaces plastered and corridors tiled. Ceilings are acoustical tile supported by a grid system, except in the large group assembly room where hard acoustical plaster is used.

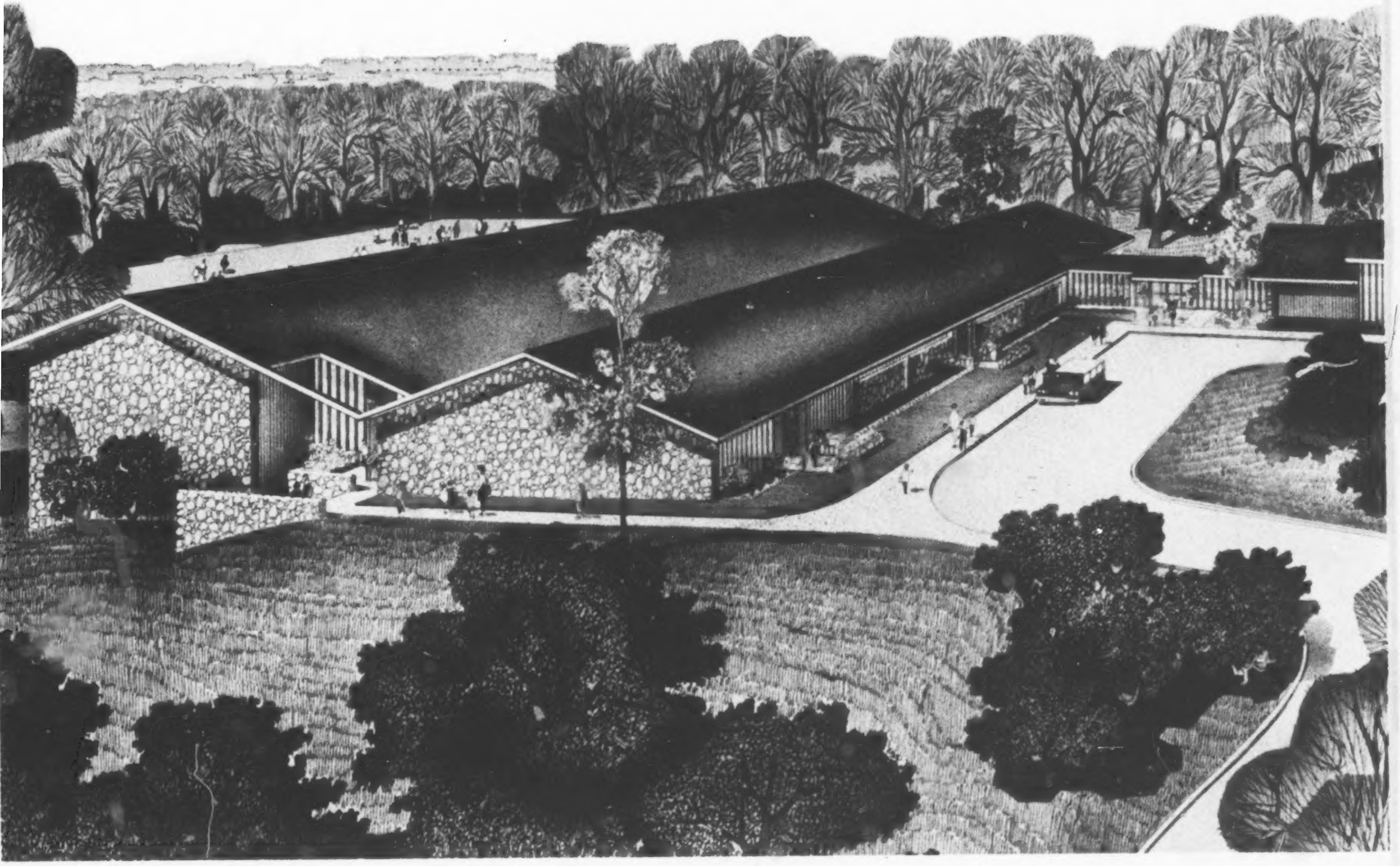
The school is heated by low pressure steam coming from central, oil-fired burners. Ventilation is mechanical, but there is provision for eventual air conditioning.

The cost of the school, excluding cost of site, movable equipment and furniture, and architect's fees, was $1,011,807. The school contains 56,537 square feet of space, thus giving a square foot cost of $17.90. The per pupil cost, figured on a capacity of 650 pupils, is $1,557.

Two on the Drawing Board

Dundee Elementary School
Greenwich, Connecticut

Sierra Vista Middle School
Covina, California



School: *Dundee Elementary School*
Greenwich, Connecticut

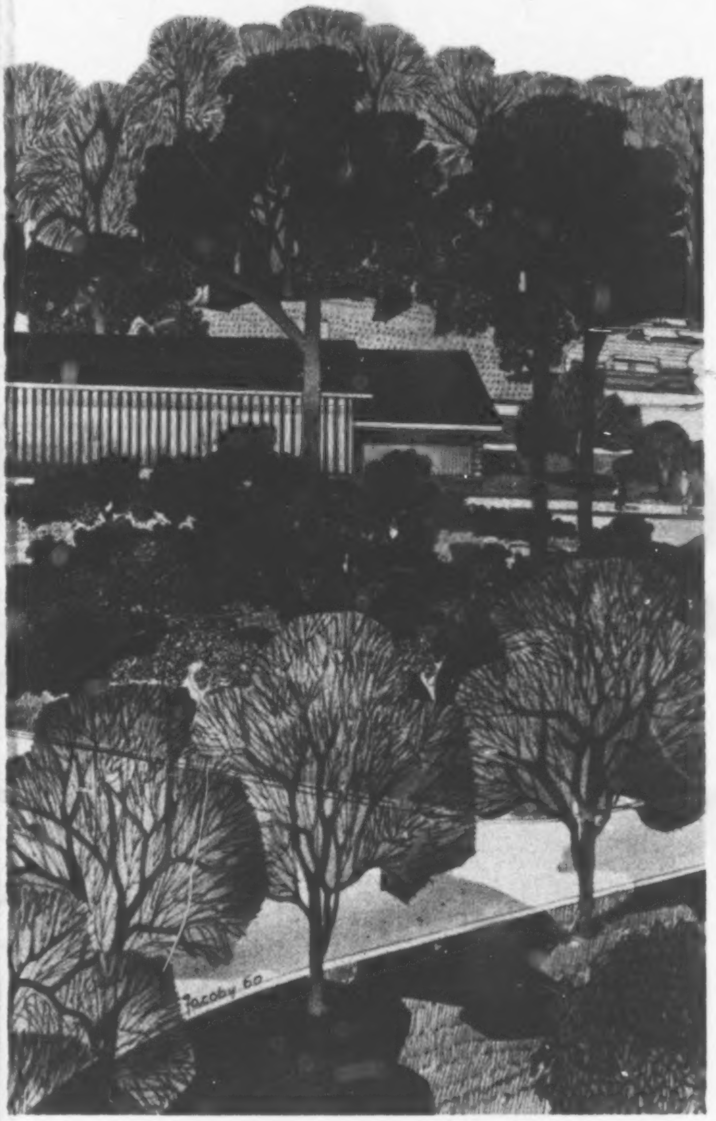
To Open: *February, 1962*

Capacity: *550 students, including*
100 kindergarten children

Grades: *K-6*

Superintendent: *John Blackhall Smith*

Architects: *Perkins and Will*
Chicago, Illinois, and
White Plains, New York



Dundee Elementary School

Greenwich, Connecticut, is a well-to-do community of 54,000 people some 30 miles from New York City in Connecticut's suburban-exurban Fairfield County. Most of the townspeople are commuters to the advertising agencies, magazines, radio and television studios, and business offices of New York City. Greenwich pays its teachers a median salary of about $7,000. Its per pupil expenditure is $500.

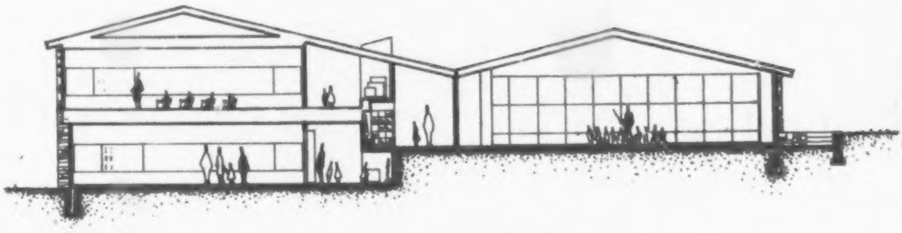
When John Blackhall Smith moved from the superintendency in Lexington, Massachusetts, to the superintendency in Greenwich in September of 1958, he brought with him the team teaching concept inaugurated with the help of SUPRAD at the Franklin School.

At this writing, team teaching does not yet exist in Greenwich. But both teams and a team school have been in the planning process since April, 1959. The team setup will be roughly similar to the one in Lexington. The design of Greenwich's Dundee Elementary School follows the general pattern of specialized spaces for special team uses laid down in the Grove Street School. Some of the spaces are made variable by operable walls. Also, as in the Grove Street School, special spaces are provided to house the teams themselves. There is a library-resource center for the students and a workroom-resource center for the teachers. The school will be provided with open- and closed-circuit television and other electronic teaching devices.

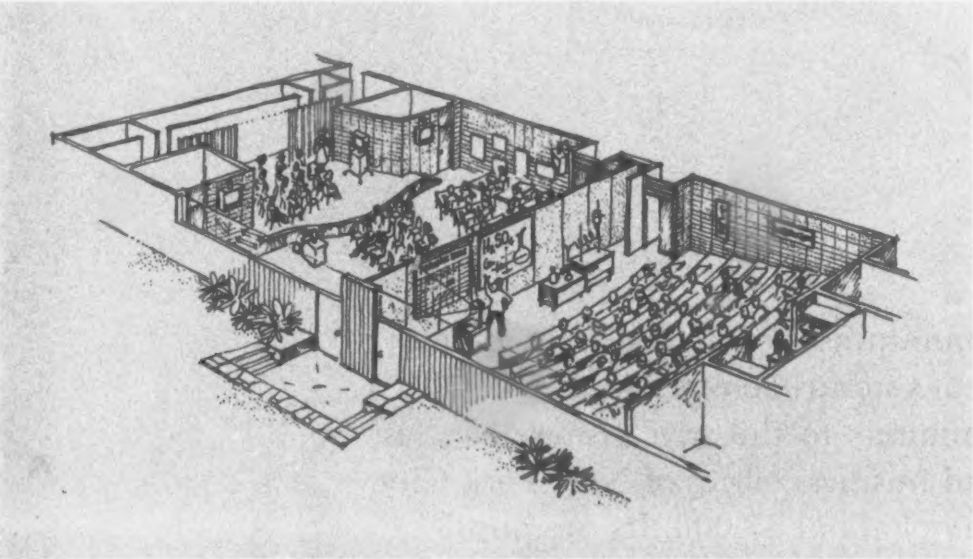
A Compact, Two-Level School

Compared to Grove Street, Dundee is a more compact school with most of its instructional spaces nestled together. (See page 46.)

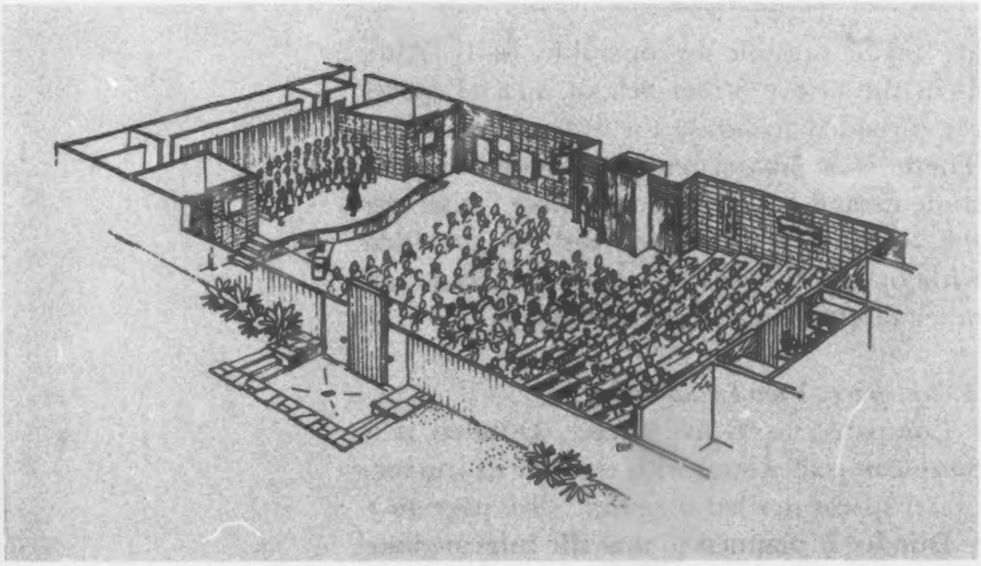
Dundee is planned so that the intermediate level which houses the large group space lies



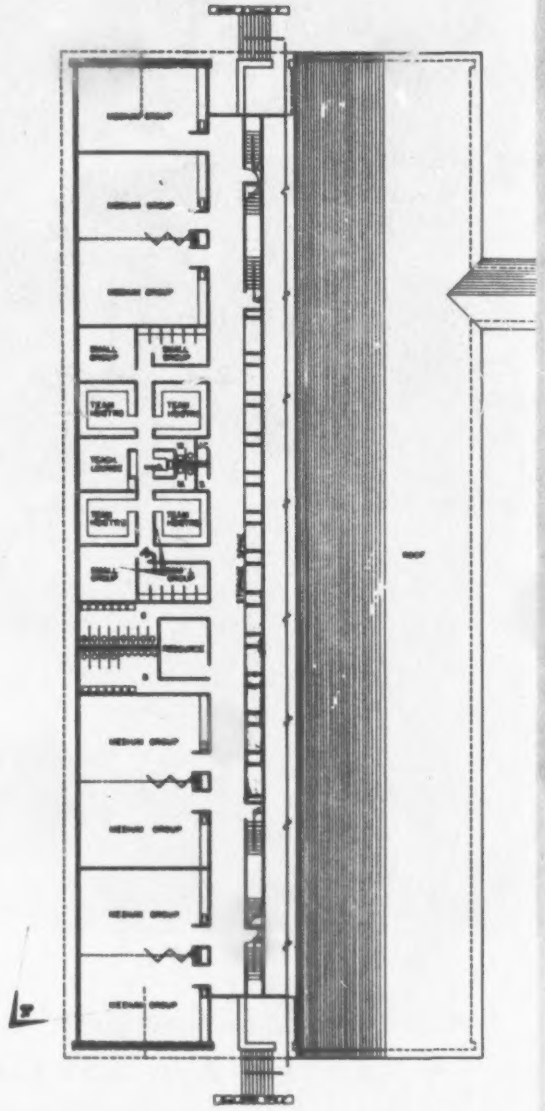
Dundee Elementary School, cross-section.



The large group area with the operable wall closed.



The large group area with the operable wall open.



UPPER
LEVEL

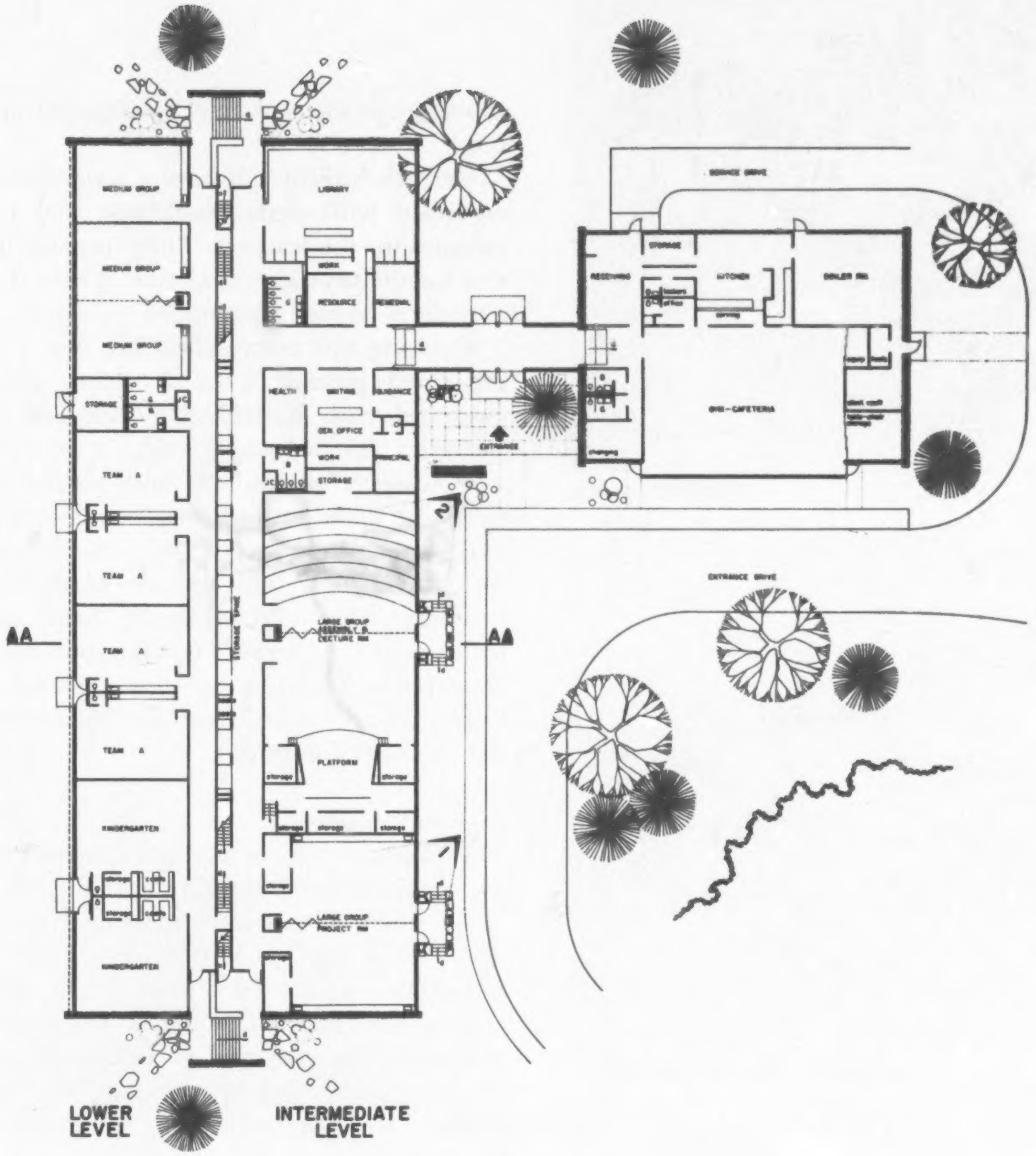
exactly halfway between the two smaller group levels and is therefore easily accessible to all concerned.

The Large Group Level

The intermediate level at Dundee houses three large rooms. One is a tiered, large group space seating 100 pupils, designed for lectures, demonstrations, and films. Next door to this is a large group space with a stage.

When the operable wall separating these two rooms is opened, they will become an auditorium seating 200 to 300 students.

Next door to the divisible auditorium is a large project room which will be equipped with all the paraphernalia of a workshop:


MEDIUM GROUP
MEDIUM GROUP
MEDIUM GROUP
STORAGE
TEAM A
TEAM A
TEAM A
TEAM A
KINDERGARTEN
KINDERGARTEN
storage
storage
STORAGE SPACE
LIBRARY
WORK
RESOURCE
REMEDIAL
HEALTH
WAITING
GUIDANCE
GEN OFFICE
WORK
PRINCIPAL
STORAGE
JC
ENTRANCE
LARGE GROUP ASSEMBLY & LECTURE RM
PLATFORM
storage
storage
storage
storage
storage
storage
LARGE GROUP PROJECT RM
AA
AA
SERVICE DRIVE
STORAGE
RECEIVING
KITCHEN
BOILER RM
serving
GYM—CAFETERIA
ENTRANCE DRIVE
LOWER LEVEL
INTERMEDIATE LEVEL

sinks, stoves, tools, paints, and storage space.

This room can be divided by an operable wall so that different groups can use it for different purposes (noisy and quiet activities at the same time, for instance).

Medium Group Spaces

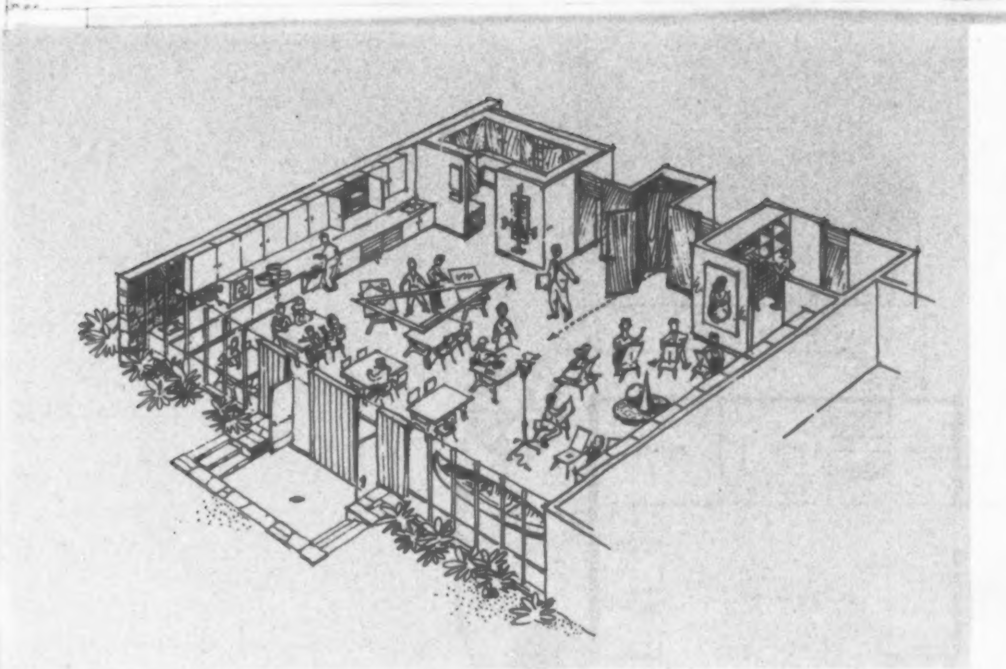
What Dundee calls medium group spaces are rooms of about 750 square feet, to be equipped with conventional classroom appurtenances: sinks, movable furniture, tack- and chalk-board, etc. In all but two cases, each of these classrooms can be joined to its neighbor by throwing back an operable wall. Thus, as in Englewood and Grove Street, the teaching teams will be able to vary the size of the space as the instructional program demands.

Conventional Classrooms

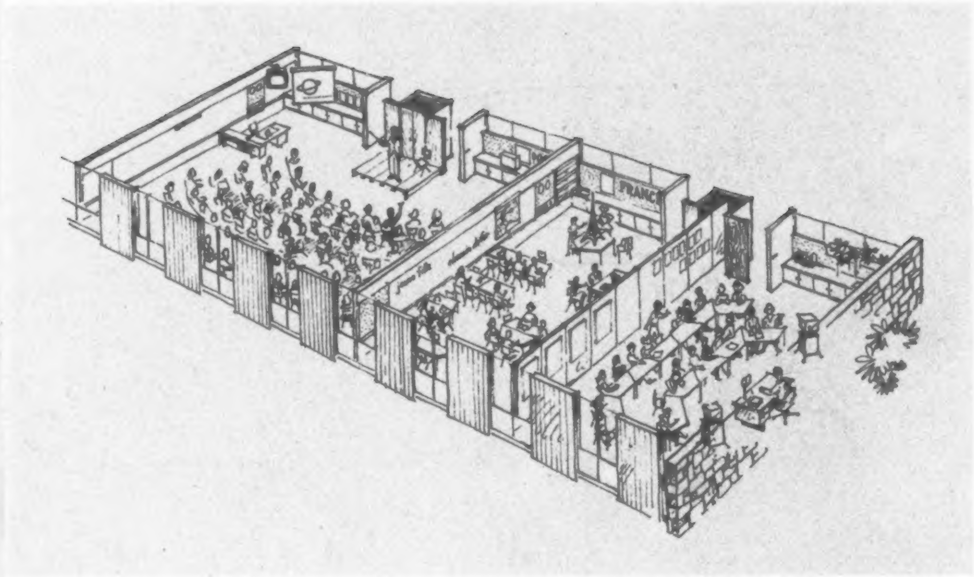
On its lower instructional level, Dundee houses classrooms devoted to kindergarten and first-grade children. These children, for the most part, will work in self-contained classrooms. They will be introduced gradually to the rapid shifts in grouping of the upper elementary grades. Consequently their classrooms do not have operable walls.

Teams and Small Groups

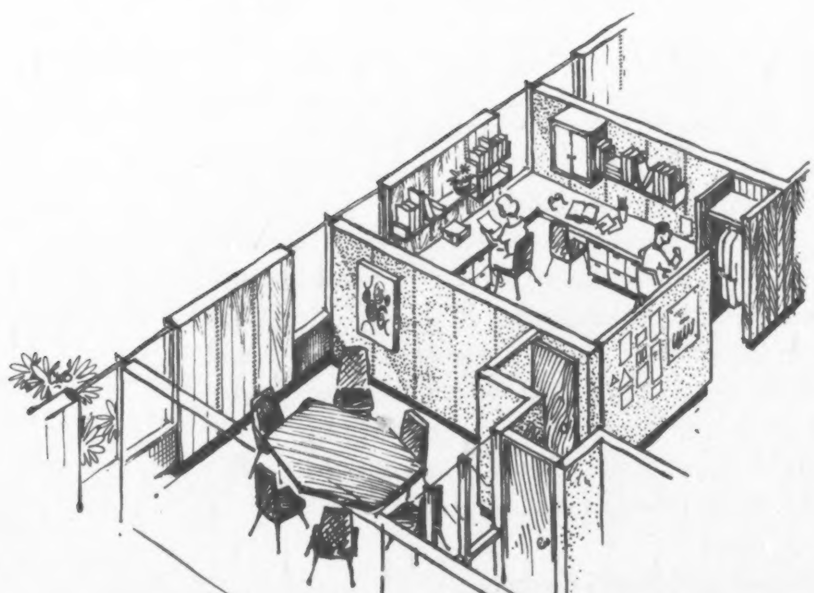
The "heart of the team teaching operation," in Smith's words, is the complex of team headquarter rooms and small group



The project area.



Adaptable medium group spaces.



A team office and small group room.

rooms set in the middle of the school's upper level.

Here each team will have a room to itself, equipped with desks, bookcases, and filing cabinets for the teachers. There is space here, too, for the team's clerical aide. There is also a teachers' lounge and conference room.

Flanking this team center are four rooms for small groups. Two of them will be equipped with individual carrels and tape recorders for language work. Two, which will be used for seminars with advanced or slow students and student-teacher conferences, will be furnished with a table and chairs for five to ten people. This complex of offices and small instructional rooms is the "heart of the team operation" because it makes possible the cooperative planning by teachers and the individualized instruction that team teaching is designed to initiate.

Communications

The school will be equipped with a complete educational communications system to enable the staff to use the most modern communications devices. This system will include television circuits for closed-circuit broadcasting and the reception of open-circuit, very-high-frequency and ultrahigh-frequency broadcasts. In addition, films, tapes, and other kinds of electronic teaching equipment will be available.

An electronic resource center near the library will link all the classrooms. For example, each classroom will have a 10 channel audio system for the teacher to draw upon, making each of the rooms a communications center all by itself.

Storage Spine

Dundee has another distinctive feature in its use of the corridors running along the two classroom levels and between these two levels at the intermediate level. These corridors have been turned into a "storage spine" where, in a variety of specialized nooks and crannies, the students can hang their coats and the teachers can store instructional supplies and audio-visual equipment such as television receivers and film projectors. Because so much storage space is available just outside the classrooms, all of the square footage in the rooms themselves is usable educational space.

Sound-Retardant Walls

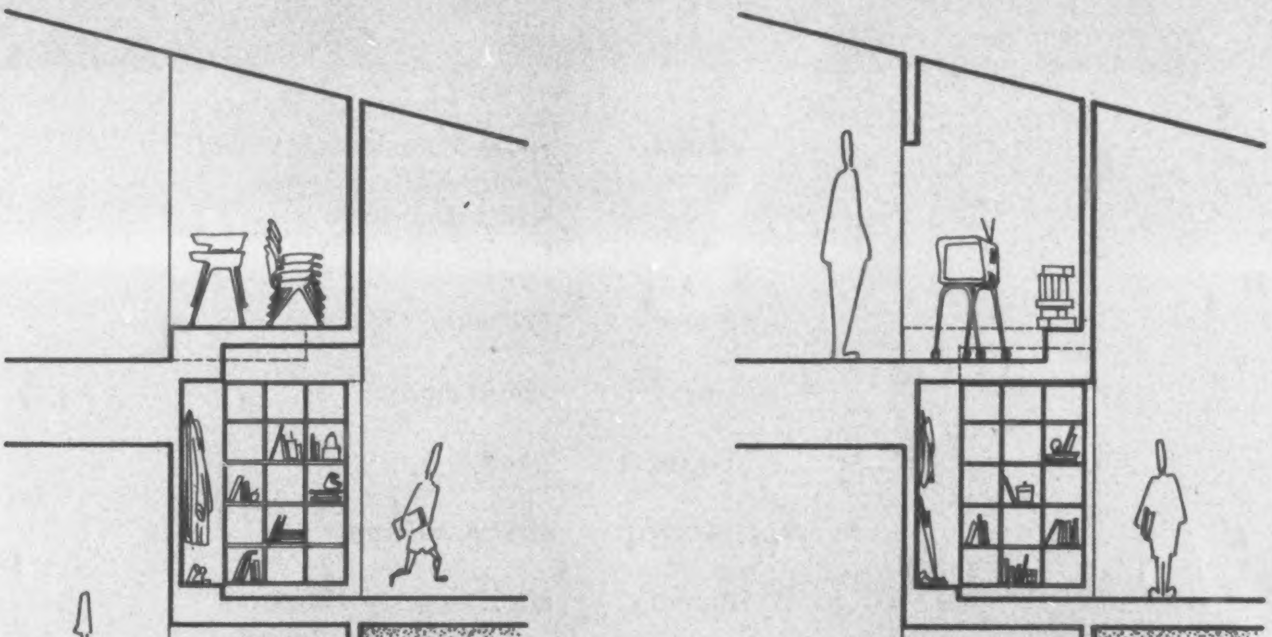
It is quite possible, as in Carson City, to design a team school that has no interior partitions. But many teachers and superintendents prefer acoustical privacy in individual spaces.

This is the case at Dundee; the architects and school administrators are exploring various advanced types of sound-retardant partitions, both custom-made and mass-produced, to provide Dundee with operable walls that will provide acoustical privacy.

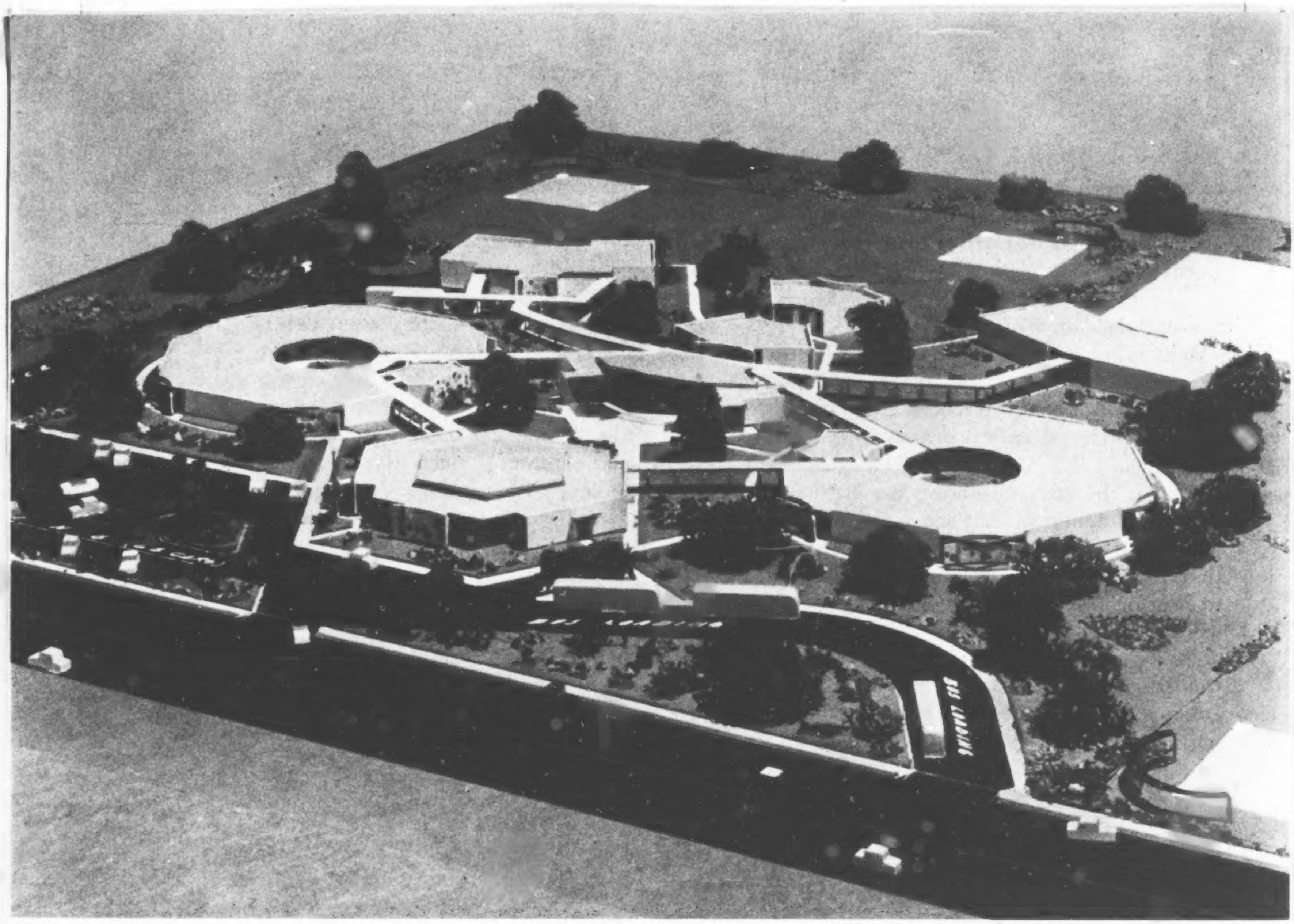
Construction and Cost

Dundee has a structural steel frame supporting its pitched roof. The floor is a concrete slab. Exterior walls are glass window-walls or board-and-batten siding except for the end walls, which are fieldstone. Ceilings are hung and covered with acoustically treated tile. Interior walls—those that are not operable—are steel-studded rock lath and plaster. Ventilation is mechanical. Heating is by finned pipe convectors except in the kindergarten rooms which have radiant heating in the floor slabs. Most of the electrical conduits and heating and ventilating ducts for the upper and lower levels travel through the storage spine and are brought into the room through the floor and ceiling.

Dundee is out to bid at the time of this writing so no accurate cost figures are available. The architects estimate the building will cost $919,700, including the cost of operable walls, the 10 channel audio system, and facilities for open- and closed-circuit television reception.



STORAGE SPINE



SCHOOL:	*Sierra Vista Middle School* *Covina-Valley Unified* *School District* *Covina, California*
TO OPEN:	*February, 1962*
CAPACITY:	*726 students*
GRADES:	*7 and 8*
SUPERINTENDENT:	*Paul B. Salmon*
ARCHITECTS:	*H. L. Gogerty Associates* *Los Angeles, California* IN CHARGE OF DESIGN: *Joseph Feil*
EDUCATIONAL PLANNING:	*Leland B. Newcomer* *Assistant Superintendent* *Ray Burkhart* *Director of Buildings*

Sierra Vista Middle School

Covina-Valley Unified School District serves 17 square miles of Los Angeles suburbia, including three cities and a large unincorporated area. Six years ago the district was largely devoted to citrus farming and had only three elementary schools and one high school. Now it has eighteen elementary schools, two high schools, and 14,500 school children. Within the next few years school enrollment is expected to reach 25,000.

Sierra Vista Middle School will open in 1962 with a team program similar in many ways to the plan now in operation at Englewood. But Sierra Vista's buildings are even more specifically tailored to a team program.

The teaching staff will operate for the most part in teams of two teachers responsible for 70 children. Each team will be composed of teachers who complement each other. If one is talented in science and mathematics, the other will be especially good in English and social studies. If one works best with smaller groups, the other will be a skilled lecturer. The two teachers will plan their classes together, but each team will also work with the other teams in the school to extend further the possibilities of grouping students by their natural abilities. Each group of ten teachers will have a teacher aide.

The work of the teams will be supplemented and enlarged through the use of television, teaching machines, language laboratories, and overhead projectors.

The crux of Sierra Vista's design is two circular buildings. (See page 53.) Each of these will house 10 teachers in 5 teams and 250 students.

Part of each circle, but a little separate from the class spaces, is the teacher headquarter area. This is where the teacher aide will work and where the teachers will have their desks, workroom, professional library, group conference area, lounge, and lavatories.

Even more important than the teacher headquarters is the physical setting for the two-teacher team—two neighboring classrooms for 70 students. This unusually shaped duplex is eminently suitable to the purpose at hand. It will be possible to join or separate the two rooms by means of a sliding partition.

When the partition is slid back into the wall, the two rooms will become one, and two classes can be brought together or arranged in whatever groupings the teachers desire.

In addition to the large sliding partitions, there will be hinged panels in a corner of each classroom which can be swung out to form a separate nook for small groups or individual study.

The duplexes will have little glass in their exterior walls—only a small window looking out over the central court. This is partly an economy measure, but has other virtues as well. This window can be quickly shut off, to darken the room for films or slides, by a section of neighboring chalkboard; when the chalkboard is moved to cover the window, a built-in screen for films is revealed behind it.

Each room will be equipped with wiring and television conduits to permit flexibility in the placement of portable television receivers on movable stands. Each of the rooms will be connected to the rest of the school via a two-way intercom system.

In the core of each of the circular buildings will be a central court, or outdoor assembly and activities area, which will be landscaped and will have a platform so that it can be used for open-air classes or assemblies.

The Library and Resource Center

The library and instructional resource center building will be between the two academic buildings. This will have two reading rooms, a seminar room, and spaces for individual study and research. It will house not only books, but tape recordings, magazines, and other instructional material.

The library-resource center opens onto an outdoor student assembly court where plays can be presented and community assemblies held. (See page 54)

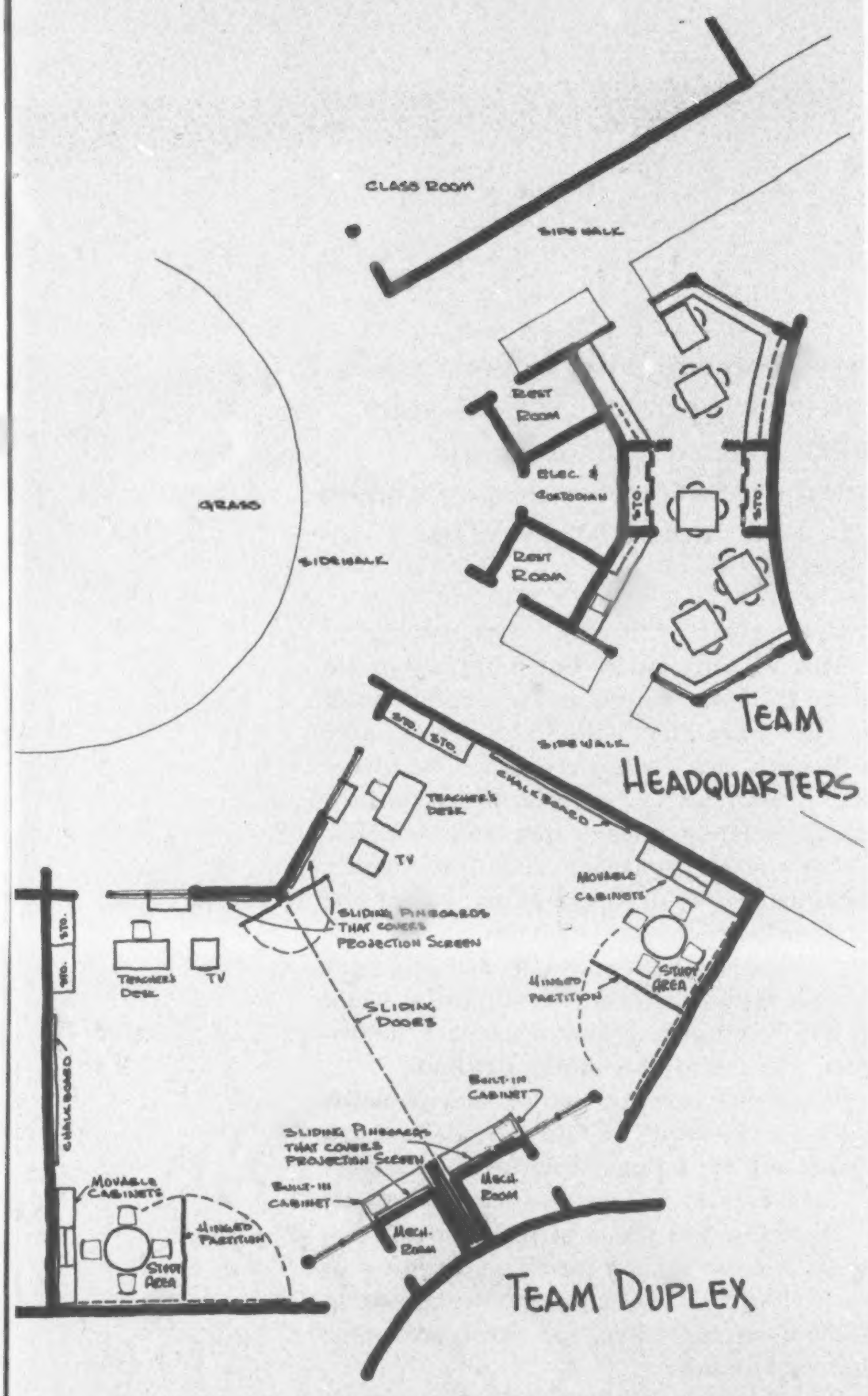
More Flexible Space

Directly north of the library-resource center building a special building is planned to provide additional space for the academic program.

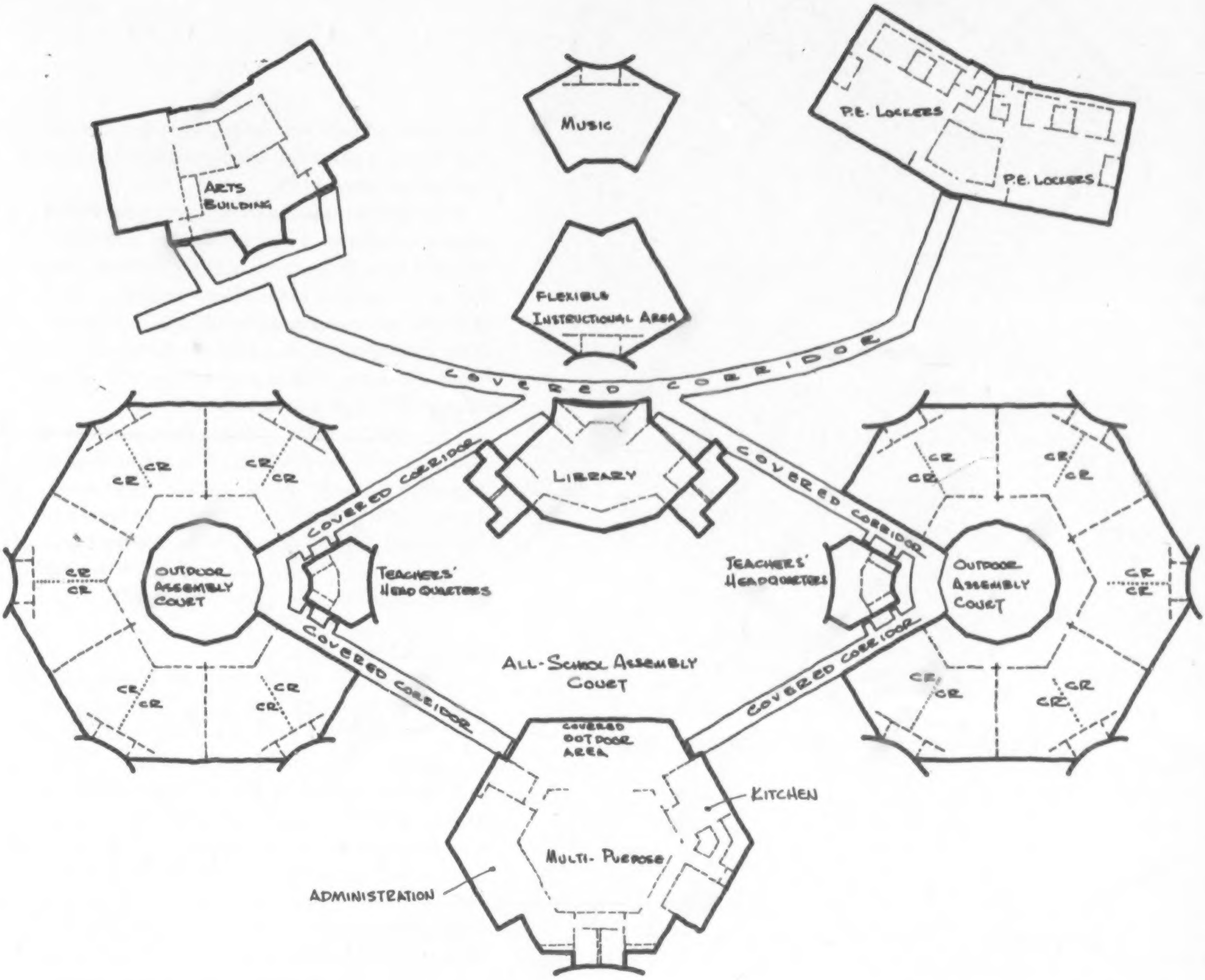
This building can be used as one large space, or it can be divided by a complex system of sliding partitions into two, three, or four rooms as necessary. Thus it will be capable of handling groups of 15, 30, 45, 60, 75, 90, or 105 students for everything from seminars to large lectures. (See page 54)

Other Facilities

Another building located almost directly between the two academic circles is devoted to administration, mechanical facilities, kitchens, and health. It contains a large cen-


CLASS ROOM
SIDEWALK
REST ROOM
ELEC. & CUSTODIAN
STO.
STO.
GRASS
SIDEWALK
REST ROOM
TEAM HEADQUARTERS
STO.
STO.
SIDEWALK
CHALKBOARD
TEACHER'S DESK
TV
MOVABLE CABINETS
SLIDING PINBOARDS THAT COVERS PROJECTION SCREEN
STO.
STO.
TEACHER'S DESK
TV
HINGED PARTITION
STUDY AREA
SLIDING DOORS
CHALKBOARD
BUILT-IN CABINET
SLIDING PINBOARDS THAT COVERS PROJECTION SCREEN
BUILT-IN CABINET
MECH. ROOM
MECH. ROOM
MOVABLE CABINETS
HINGED PARTITION
STUDY AREA
TEAM DUPLEX

Part of one of the two circular teaching buildings. Each two-teacher team will occupy two neighboring classrooms separated only by a folding partition.


Arts Building
Music
P.E. Lockers
P.E. Lockers
Flexible Instructional Area
Covered Corridor
Library
Covered Corridor
Covered Corridor
CR
CR
CR
CR
CR
CR
Outdoor Assembly Court
Teachers' Head Quarters
Teachers' Headquarters
Outdoor Assembly Court
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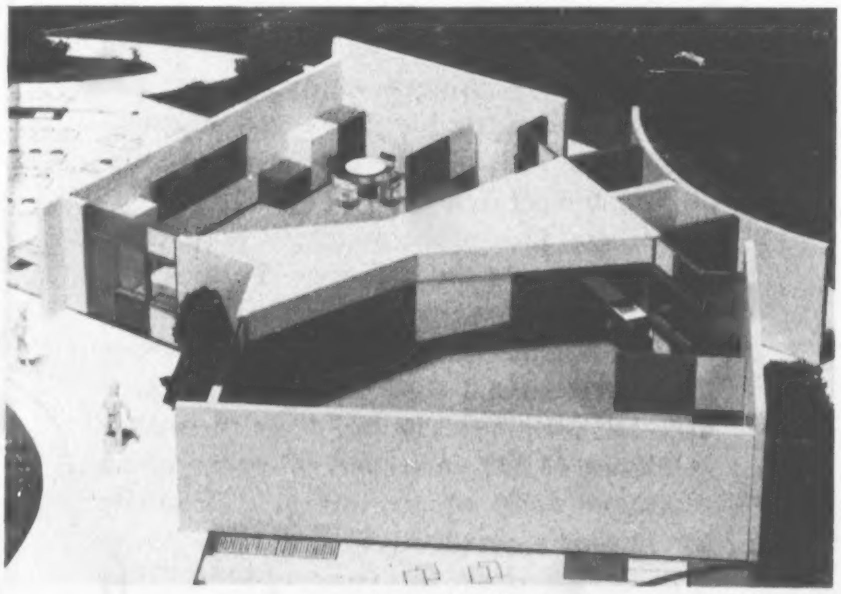
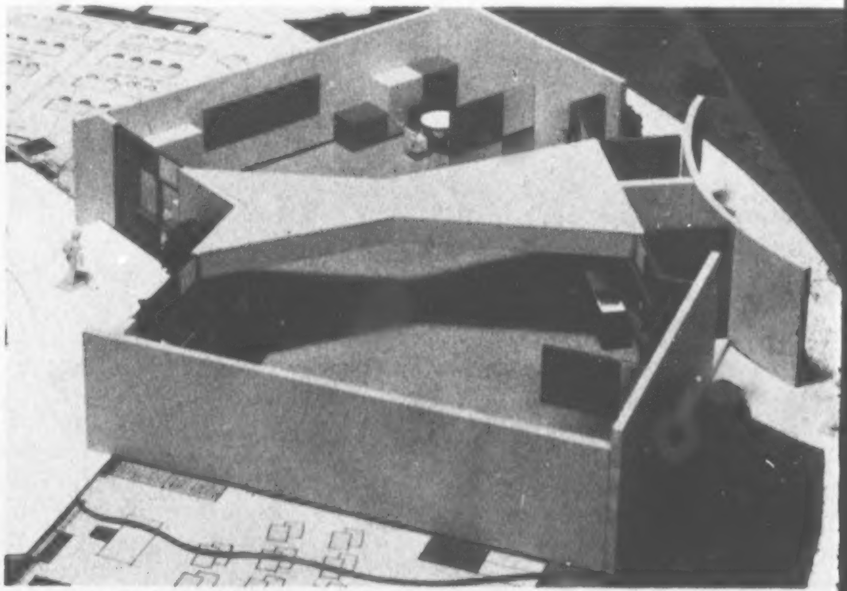
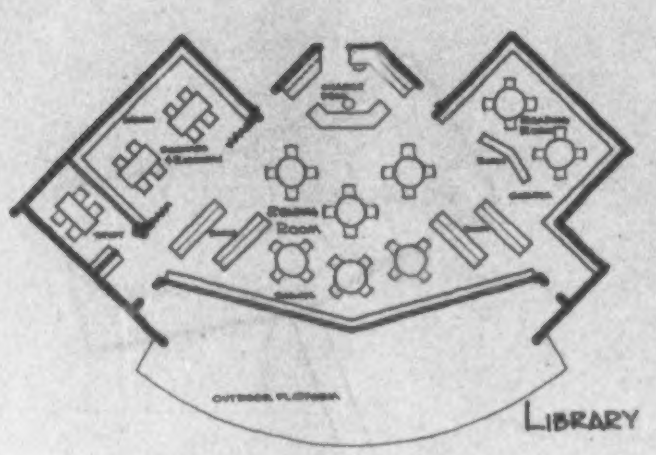
Covered Corridor
Covered Corridor
All-School Assembly Court
Covered Outdoor Area
Kitchen
Multi-Purpose
Administration



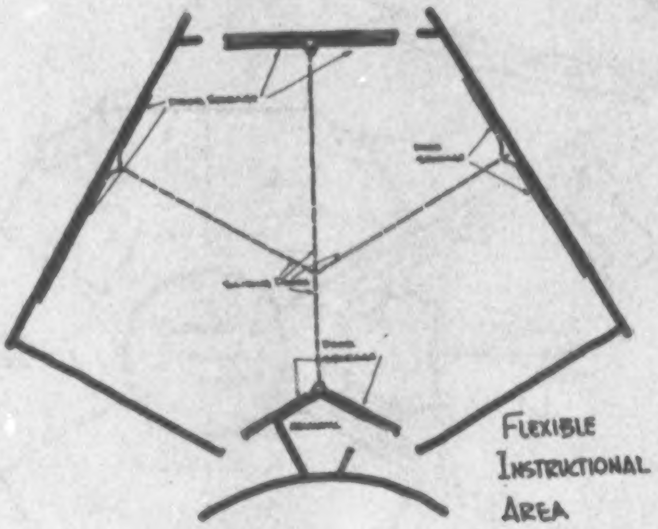
A team duplex with the partition closed.



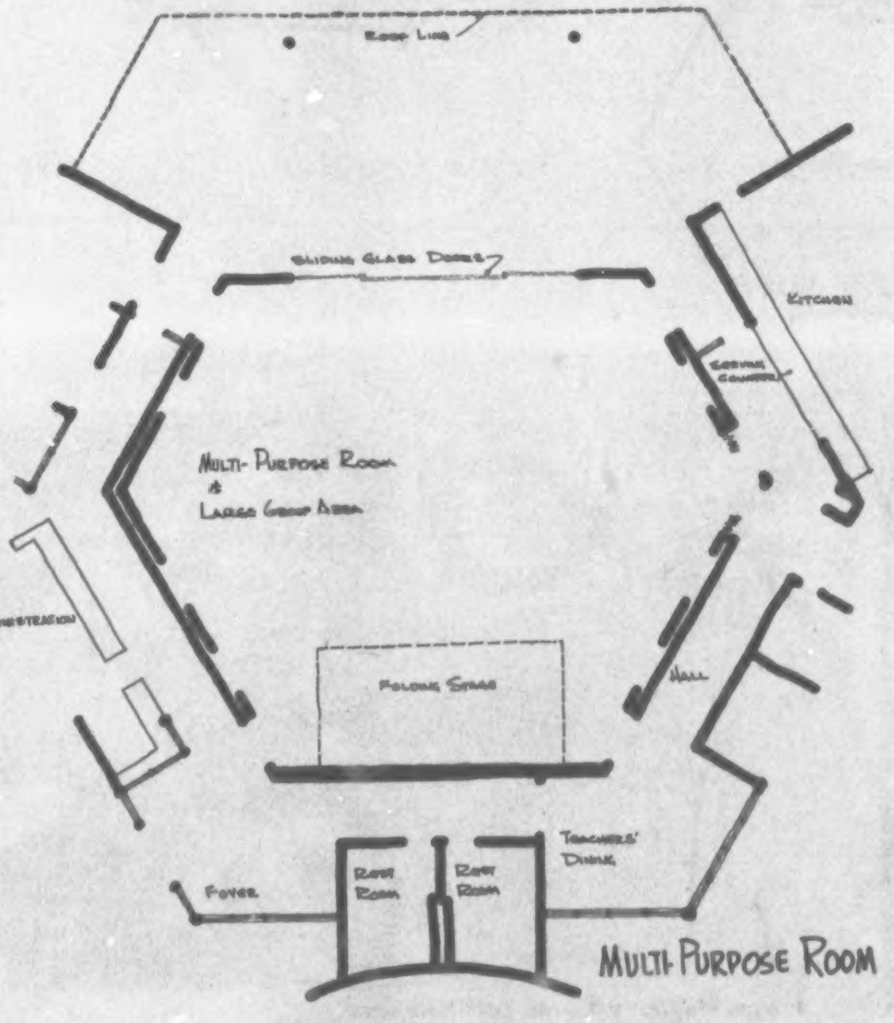
A team duplex with the partition open.



LIBRARY



FLEXIBLE INSTRUCTIONAL AREA



MULTI-PURPOSE ROOM

tral space which will be used as a cafeteria and also as a place for large group instruction and indoor assemblies.

This central space will be equipped with a folding platform. The rear wall of the building will be a large, glass sliding door leading out to a covered area where people can sit and still see into the assembly space. For outdoor gatherings this covered space will become the stage, and the audience will sit in an assembly area just beyond it.

The Sierra Vista design also includes a building with industrial and fine arts, domestic science, and small group instruction spaces, and a building devoted to physical education. There is, too, a music-drama-speech building which will double as a little theater, seating from 75 to 100 people.

Cost and Economy

In designing Sierra Vista, the architects were working under several distinct limitations. The school is to be built under the California state aid program which grants state money only if the maximum cost of the school does not exceed the average cost of non-state-aided schools built in the same area.

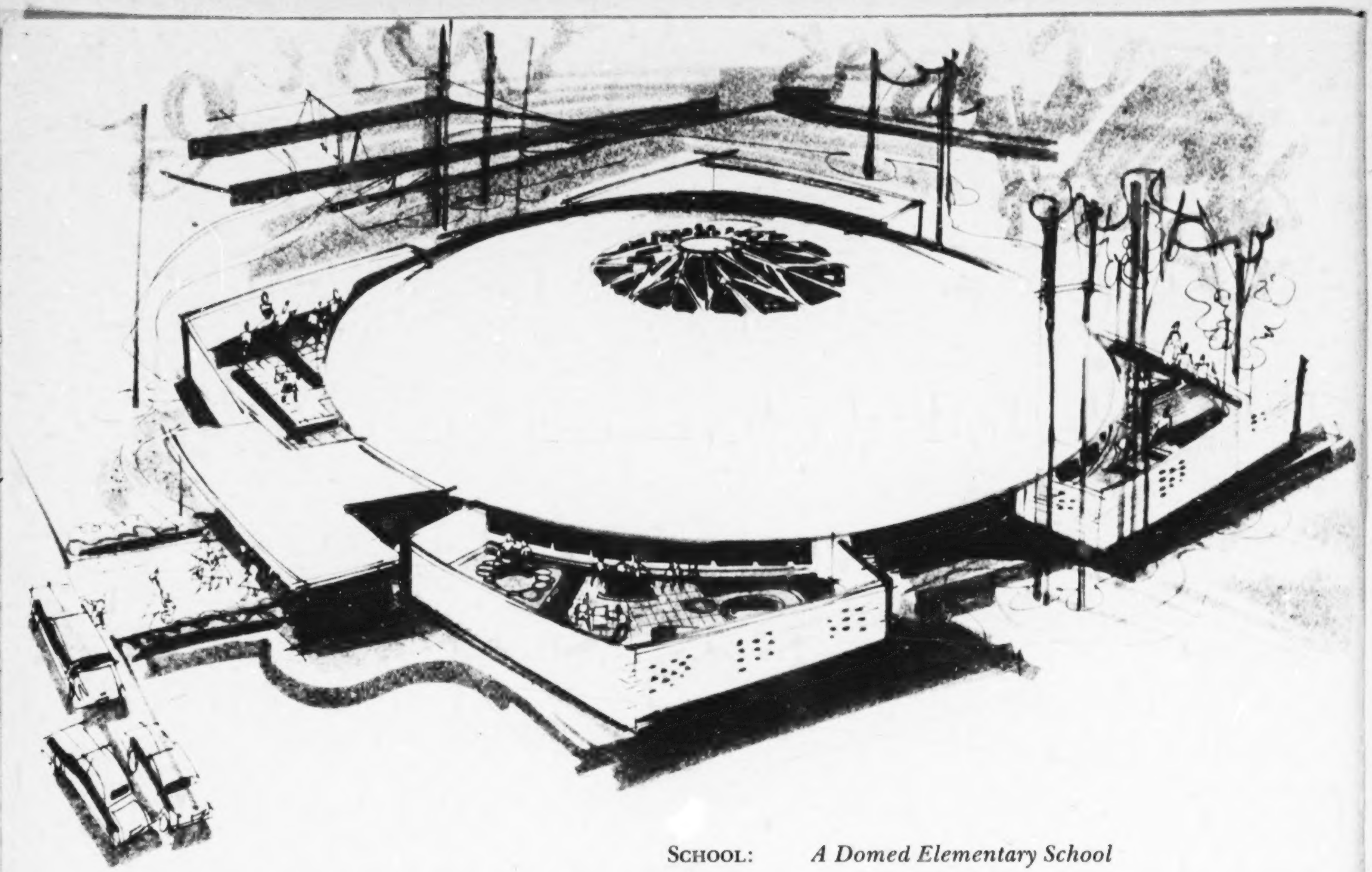
In order to be as economical as possible, the architects eliminated all corridors and replaced them with covered, but unenclosed, walkways. They attempted to make the design of the buildings as simple as possible; most of the walls will be put together on the site and tilted into place. The architects also attempted to save money on construction and maintenance by using as much concrete and as little glass as possible. The school's heating and ventilating equipment is relatively simple and inexpensive, too.

By these devices, the architects hope to be able to construct the buildings of this school —including all of the mechanical facilities, but not including the site or site development, professional fees, surveys, or furnishings—for $819,777. The buildings themselves will house 44,833 square feet of space with an additional 8,986 square feet (17,972 square feet figured at one-half) of covered walkway. This yields a square foot figure of $15.23. The per pupil cost, for 726 pupils, is $1,129.

Two for the Future

A Domed Elementary School
Designed by Caudill, Rowlett & Scott

Flowing Wells Elementary School No. 3
Tucson, Arizona



SCHOOL: *A Domed Elementary School*

CAPACITY: *150 students*

GRADES: *K-4 or K-6*

ARCHITECTS: *Caudill, Rowlett & Scott*
Houston, Texas
Oklahoma City, Oklahoma
Stamford, Connecticut

EDUCATIONAL CONSULTANTS: *John Blackhall Smith*
Greenwich, Connecticut

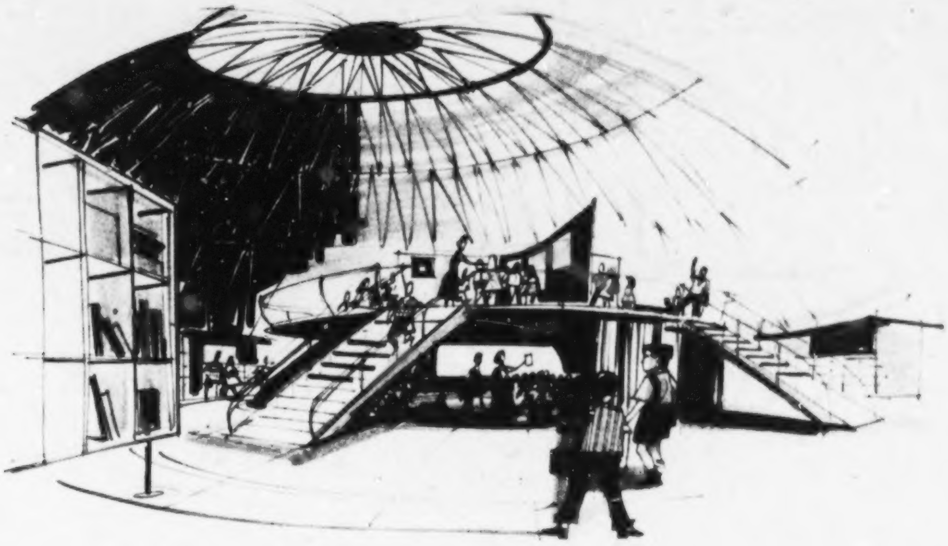
David Sanders
University of Texas

Harry Becker
Norwalk, Connecticut

Robert H. Anderson
Harvard University

John I. Goodlad
University of California
at Los Angeles

James D. MacConnell
Stanford University
and others



The mezzanine, with the sunken assembly area below.

This school was in the process of preliminary design in the spring and summer of 1960 for the school system of Port Arthur, Texas. Upon the failure of a local bond issue, however, plans for the experimental building were abandoned by Port Arthur. The architects hope to build it, or a school similar to it, for another client.

The dome school was first conceived to explore two possibilities:

- That some of the newer construction methods for enclosing large, uninterrupted areas with forms such as domes and hyperbolic paraboloids might be uniquely suitable to enclosing some of the newer educational techniques such as team teaching and the nongraded program.
- That these same new methods might well prove a more *economical* way to enclose such programs than the conventional box design.

The dome school, thus, is an attempt to extend the basic premise behind Carson City's open spaces to its logical architectural conclusion.

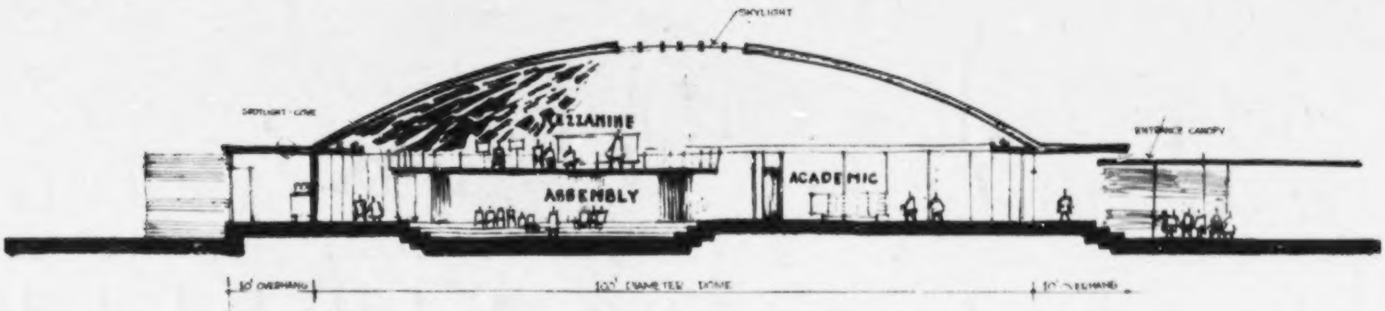
Again, No Walls

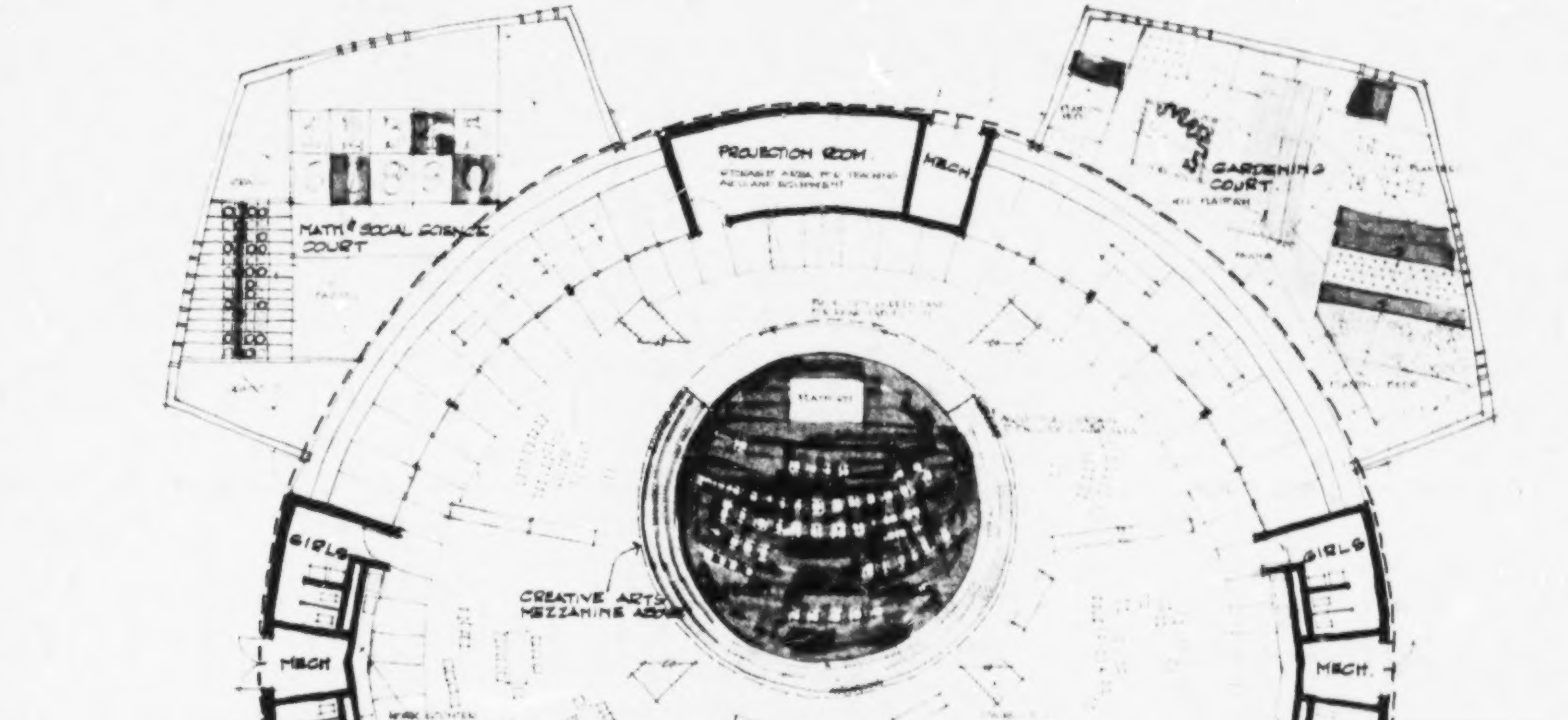
The great virtue of a dome, besides its apparent economy, is that it provides a large area of usable, enclosed space uninterrupted by supporting columns or load-bearing walls. One of the main requirements of team teaching and the nongraded organization, is that little or nothing (if possible) should interfere with the free arrangement of students into groups of sizes varying according to their needs and abilities.

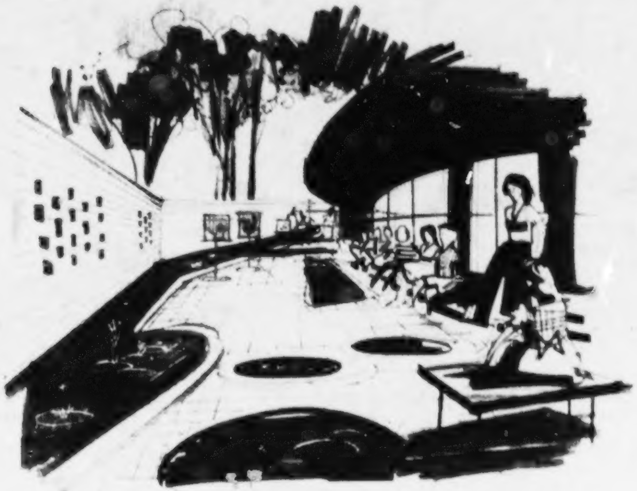
But as radical a departure as the dome school raises some obvious problems. One is noise in a school with no interior walls—the same problem encountered in Carson City. Another is how to determine the wisest use of circular, completely open space. A third arises because a dome goes up, and much of the enclosed space lies in the inner part of the building where it is liable to be wasted.

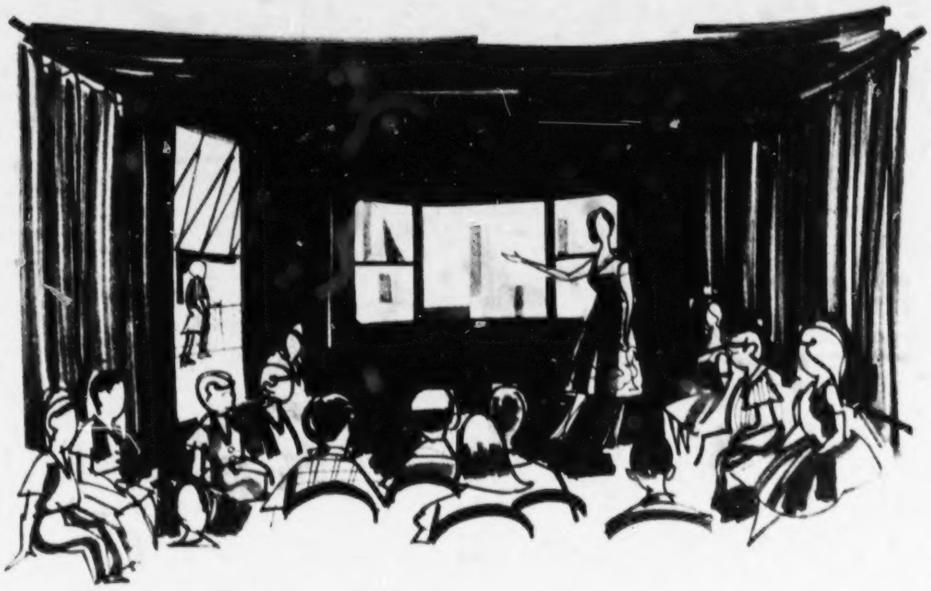
After much thought and consultation, the architects came up with a design for a nongraded, team teaching, primary or elementary school for 150 students and 6 teachers under a wood dome. (See page 58.) The plan that Caudill, Rowlett & Scott conceived is based upon the free flow of teachers and students within an open, three-level space.

Except for the concrete stairway arches supporting the ceiling of the assembly area, the space inside the dome is completely free.


SKYLIGHT
SKYLIGHT CONE
MEZZANINE
ASSEMBLY
ACADEMIC
ENTRANCE CANOPY
10' OVERHANG
100' DIAMETER DOME
10' OVERHANG


PROJECTION ROOM
MECH
MATH & SOCIAL SCIENCE COURT
GARDENING COURT
GIRLS
MECH
BOYS
CREATIVE ARTS MEZZANINE ABOVE
GIRLS
MECH.
BOYS
ACADEMIC AREA
ARTS & CRAFTS COURT
ENTRY
NATURAL SCIENCE COURT
ENTRANCE CANOPY





As in Carson City, teachers would plan the use of the space according to the activities and groupings appropriate to each school day.

The teachers have three different kinds of space to work with:

- The academic level broken up only by movable space dividers and furniture.
- The sunken assembly area that can be separated both visually and acoustically by leaded acoustical curtains.
- The upper mezzanine area devoted to arts and crafts and any other activities that might involve freer, more noisy activities than the academic work below.

Extending the Dome Space

At the outer fringes of the dome, but still covered by it, are three solidly enclosed spaces: two sets of toilets and a projection room for rear-screen television and film projection into the assembly area.

Out beyond the dome, the architects have placed four outdoor courts, one each devoted to natural science, gardening, arts and crafts, and math and social science.

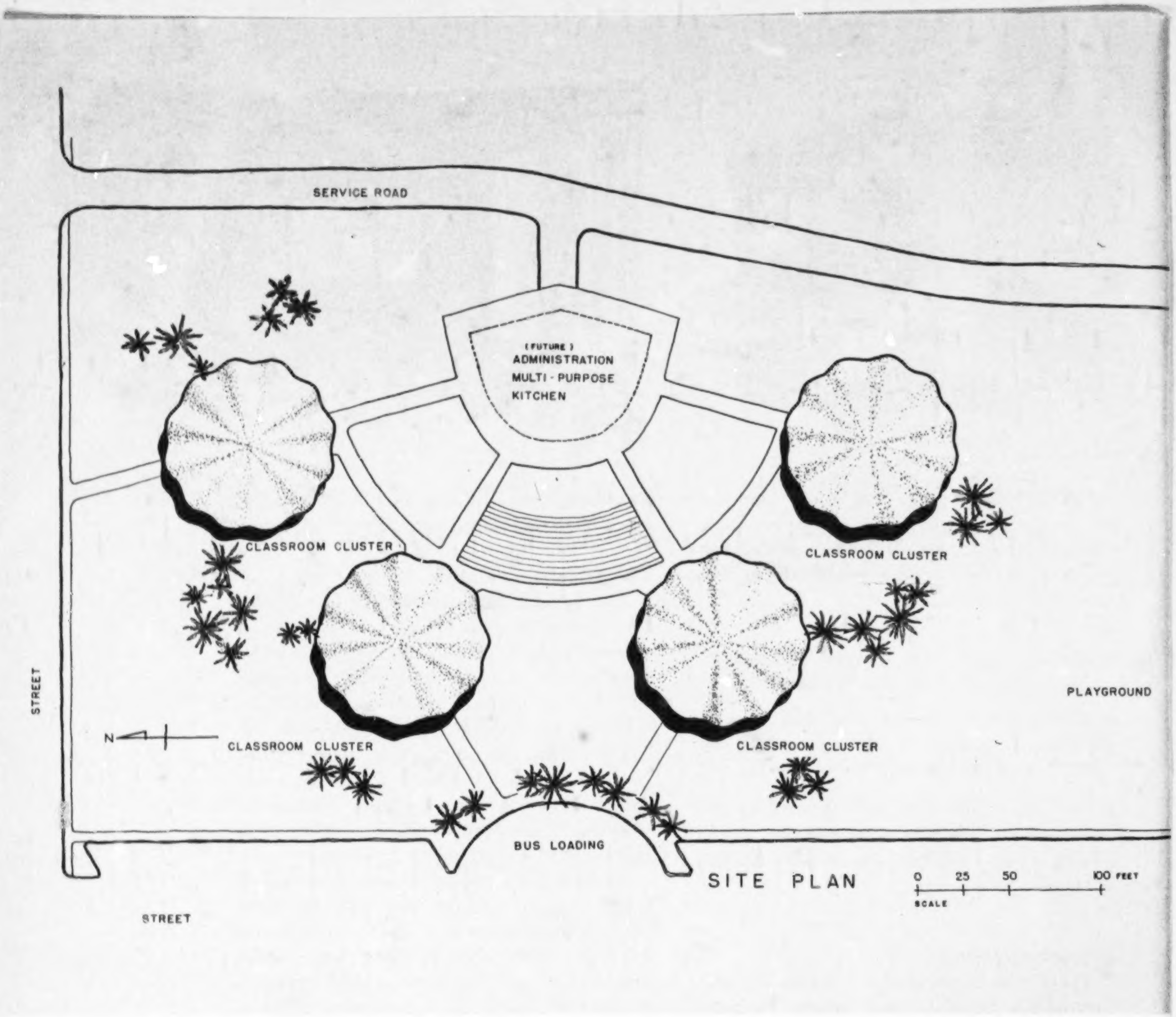
The outdoor idea arose because the school was originally designed for the warm climate of Texas. But Caudill thinks that, with radiant heating in the concrete slabs, these outdoor spaces would be usable most of the year even in northern climates. Or, if necessary, they could become enclosed courtyards simply by providing a movable roof for use when the temperature drops. At any rate, the courts considerably extend the usable educational space that the teams have at their disposal.

The Nuisances of Sound

The Caudill team started this school with the assumption that a certain amount of general noise is not going to distract the students and teachers from their appointed rounds. This is the assumption behind Carson City and behind many schools that the Caudill firm has designed in recent years, notably, the Carl Underwood School in Andrews, Texas. It seems to work successfully wherever it has been intelligently attempted, but it is still a hotly debated subject.

There is, however, an adjustment which, in Caudill's opinion, might help keep the noise level within bounds in the school—carpet on the floor. This is not a new idea. The Caudill firm tried it in a neighborhood primary school in Andrews, Texas. It has worked well there, and newer types of long-lasting, lower cost carpeting are now being tested to make the plan even more feasible. Carpeting in the dome school would go a long way toward absorbing sound.

In addition, the sunken assembly area would provide the dome school with one area that could be acoustically isolated from the rest of the school. Recent tests on newly developed, leaded acoustic curtain indicate that a double curtain mounted on an electrically operated track would provide this assembly area with acoustical privacy comparable to a 4 to 6 inch thick concrete block wall. This would make the area suitable for the use of most known audio devices.


SERVICE ROAD
(FUTURE)
ADMINISTRATION
MULTI - PURPOSE
KITCHEN
CLASSROOM CLUSTER
CLASSROOM CLUSTER
STREET
N
CLASSROOM CLUSTER
CLASSROOM CLUSTER
PLAYGROUND
BUS LOADING
SITE PLAN
0 25 50 100 FEET
SCALE
STREET

School: *Flowing Wells Elementary School No. 3*
Tucson, Arizona

To Open: *Fall, 1961*

Capacity: *500 students*

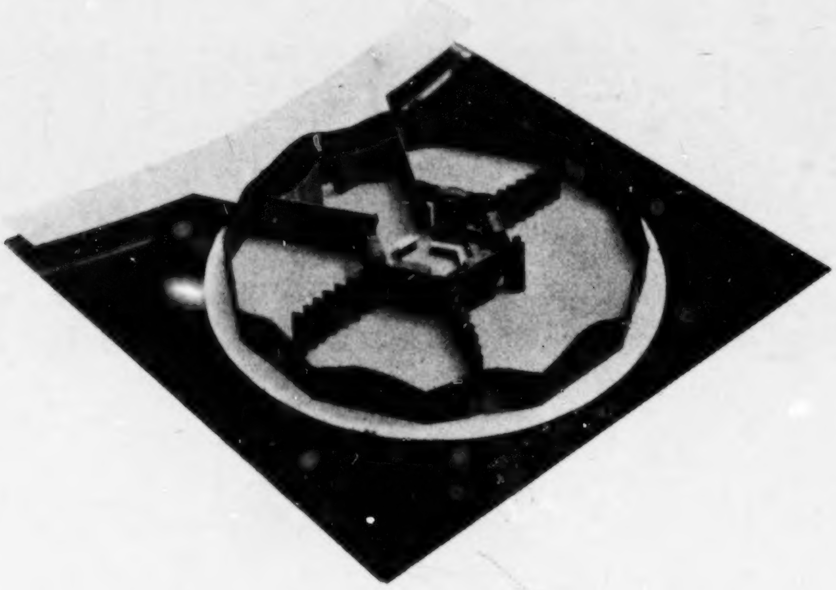
Grades: *K-4*

Superintendent: *George N. Smith*

Architects: *Shaver and Company*
Kansas, Nebraska, Arizona

Associated Architects: *Reid and Hazard*
Tucson, Arizona

Flowing Wells Elementary School No. 3

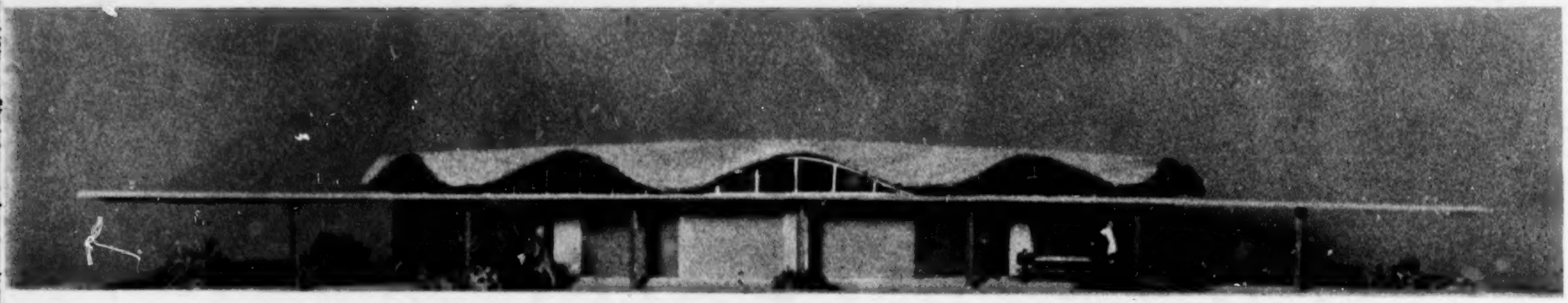


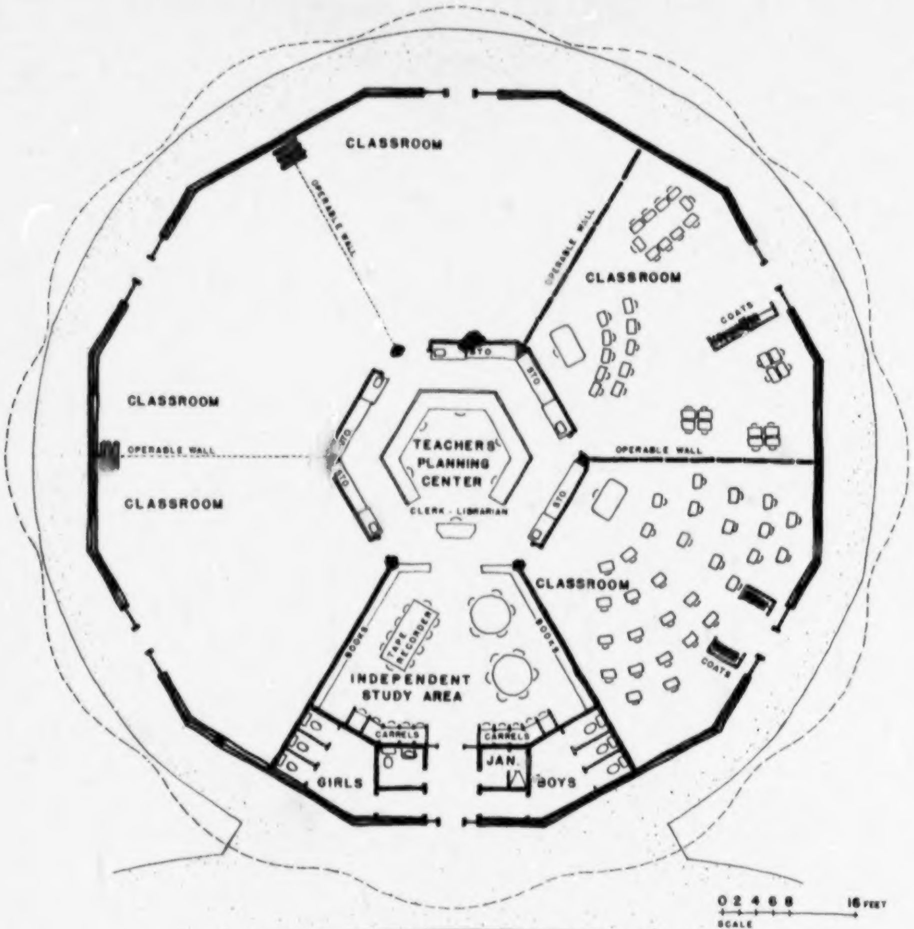
Eighty-three per cent of Flowing Wells School District lies within metropolitan Tucson. The district, until recently an agricultural area, now has 12,000 suburbanites with 2,500 school-age children. By 1965, the population and its schools is expected to double.

Flowing Wells Elementary School, which is still in the process of design, attempts to bring together into one plan many of the ideas set forth in other team schools discussed in this *Profile*.

The school will have no formal grades. Instead, children will be classified by achievement, ability, and interest into 18 different levels ranging in conventional terms from kindergarten through grade four.

There will be four teams, each composed of five teachers and a librarian-clerk and assigned about 125 children. Each team will operate in its own cluster, and the four clusters will be arranged in a semicircle around an outdoor amphitheater.




CLASSROOM
OPERABLE WALL
CLASSROOM
OPERABLE WALL
CLASSROOM
OPERABLE WALL
CLASSROOM
STO
STO
STO
STO
COATS
TEACHERS' PLANNING CENTER
CLERK - LIBRARIAN
OPERABLE WALL
CLASSROOM
BOOKS
TAPE RECORDER
BOOKS
COATS
INDEPENDENT STUDY AREA
CARRELS
CARRELS
GIRLS
JAN.
BOYS
0 2 4 6 8 16 FEET
SCALE

TYPICAL CLUSTER PLAN

Eventually a central administration and multipurpose building will be added to the school.

Each team will group the children as the program and the individual achievement levels of the children dictate. If a child's achievement in arithmetic indicates he should be studying at the level housed in the building next door, he will be free to spend time in that building for his arithmetic lessons.

The Cluster and Instructional Center

The basic cluster at Flowing Wells will be a circular building divided into six rooms. Five of the rooms will be classrooms, some separated only by operable walls, and the sixth will contain instructional materials, spaces suitable for independent study and committee work, and toilets.

At the center of each building is the teachers' planning center. Here, each teacher has her own desk, as does the clerk-librarian who will oversee independent work that is done in the instructional materials area.

Construction

Although final planning decisions have not yet been made, the buildings will be covered by thin-shell concrete roofs. The architects expect that the use of thin-shell concrete will lower the cost of the school 10 to 15 per cent.

All of the buildings will be air-conditioned, since the climate in Tucson makes non-air-conditioned buildings uncomfortable from May to October.

All plumbing, heating, and cooling ducts and pipes will be fed into the classrooms from a central utility core. The school will be provided with conduits so that closed-circuit television may be added at a later date.

Epilogue

In the present state of educational ferment, any school designed for team teaching is going to be unique. It will—and should—be tailored to the individual specifications of the local team program. But there are a few general considerations that have suggested themselves and will bear summary.

1. All team programs involve a great deal of movement, including the forming and dispersing of large and small groups. The building which encloses a team program, therefore, must make such movement and such grouping as natural and easy as possible, while still avoiding chaos.

2. Team programs seem to gravitate toward a non-graded organization. As students cut across grade lines, there is a tendency to put a greater emphasis on self-directed or individual study. In terms of space, this tendency indicates, a radical enlargement and broadening of the school library into a central instructional resource center with an increasingly wide range of materials, including tapes, records, and periodicals in addition to books, which are easily accessible.

3. The increased amount of cooperative planning and preparation which a team program calls forth suggests that special team headquarters space and special teacher workrooms might well be provided.

4. Most team programs now in operation or in the planning stage seem also to be moving toward an increased use of audio-visual aids such as television, large-screen projectors, films, and tape recorders, and toward the possible use of automated teaching machines or programmed books. Team schools might well be designed with these devices in mind.*

If there are no easy or ideal solutions to the problem of how to design a team school, one thing remains clear: our traditional idea of a school—rows of identical boxes strung along both sides of a central corridor—no longer applies. If the team is an improvement on the lone teacher in the self-contained classroom—and the evidence suggests that it is—then our idea of what a school is and does must also change. To this extent, the schools described in this PROFILE are representative of the American school of the future.

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*See *Design for ETV*, an EFL Report.

Picture Credits

Teaching In Teams George Zimbel

Englewood Elementary School
Pages 16 (bottom), 19: Robert Ford
All others: Philip H. Hiss

Carson City Elementary School
Louis C. Kingscott & Associates

Lessenger Elementary School
Page 28 (lower left corner): C. F. Rank
All others: M. R. LaMotte

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Other EFL Publications

Here They Learn
EFL's first annual report

Ring the Alarm!
A memo to the schools on fire and human beings

The Cost of a Schoolhouse
Planning, building and financing the schoolhouse

Design for ETV—*Planning for Schools with Television*
A report on facilities—present and future—needed to accommodate instructional television and other new educational programs

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Profiles of Significant Schools: *A Continuing Series*
Belaire Elementary School, San Angelo, Texas
Heathcote Elementary School, Scarsdale, New York
Montrose Elementary School, Laredo, Texas
Public School No. 9, Borough of Queens, New York
Two Saginaw Middle Schools, Saginaw Township, Michigan
A & M Consolidated Senior High School, College Station, Texas
Hillsdale High School, San Mateo, California
Newton South High School, Newton, Massachusetts
North Hagerstown High School, Hagerstown, Maryland
Rich Township High School, Olympia Fields, Illinois
Wayland Senior High School, Wayland, Massachusetts

New Schools for New Education
Report on the University of Michigan conference on new school design

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Case Studies in Educational Facilities: *A Continuing Series*
Conventional Gymnasium vs. Geodesic Field House
West Bethesda High School, Montgomery County, Maryland